DOCUMENT RESUME

ED 079 298 SP 006 716

TITLE	New Ideas for Bowling Instruction.
INSTITUTION	American Association for Health, Physical Education, and Recreation, Washington, D.C.
PUB DATE	70
NOTE	95p.
AVAILABLE FROM	NEA Publications-Sales, 1201 Sixteenth St., N.W., Washington, D.C. 20036 ($3.00)
EDRS PRICE	MF-$0.65 HC Not Available from EDRS.
DESCRIPTORS	Athletic Equipment; Manuals; *Physical Education; Physical Education Facilities; *Physical Recreation Programs; Recreational Activities; Teaching Methods
IDENTIFIERS	*Bowling; Bowling Instruction

ABSTRACT

This document is an instructor's manual for teaching bowling to a wide range of students (elementary school to college) in either a school gymnasium or a teaching station with limited space. The material presented was adapted from teaching methods that had proved successful in diverse situations with many students. The manual is divided into fourteen chapters, including ones on bowling equipment and specifications, bowling etiquette and safety, basic fundamentals of bowling, evaluation and testing, administrative concerns, and bowling opportunities. Also included in the manual are drawings and diagrams, a glossary of bowling terms, a list of useful references and, as an appendix, a brief history of bowling which traces bowling back to the ancient Polynesians. (JA)

ED 079298

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL BY MICROFICHE ONLY HAS BEEN GRANTED BY

NEA

TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."

NEW Ideas FOR BOWLING INSTRUCTION

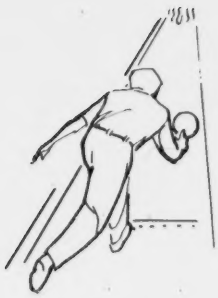
LIFETIME SPORTS EDUCATION PROJECT

SP 006 716

Copyright © 1970
AMERICAN ASSOCIATION FOR HEALTH,
PHYSICAL EDUCATION, AND RECREATION
A National Affiliate of the National Education Association
1201 Sixteenth St., N.W., Washington, D.C. 20036

Price: $3.00
Order from: NEA Publications Sales,
1201 Sixteenth St., N.W., Washington, D.C. 20036.
Discounts: 2-9 copies, 10%; 10 or more, 20%.

PREFACE



This guide is one of a series of "Ideas" manuals developed as a result of the AAHPER Lifetime Sports Education Project which was originally supported through a grant from the Lifetime Sports Foundation and which had its inception in June, 1965. The National Bowling Council has continued to partially fund the Project. The sports activities included in this project are badminton, bowling, golf, and tennis. Archery has been included through the cooperation of the AAHPER Outdoor Education Project.

A special revisions committee was appointed in 1969-70 to organize the existing bowling materials under one cover and to add new ideas and innovations resulting from the experience gained in Project clinics during the initial three years of operation. The members of the committee, who are listed below, represent varying aspects of Project activities and instructional levels:

Donald R. Casady, Chairman of Committee; University of Iowa, Iowa City, Iowa (Editor)

Jerry Akin, Executive Director, Oklahoma State BPA, Oklahoma City, Oklahoma (deceased)

Clare Albom, Supervisor of Health and Physical Education, Town of Vernon Schools, Rockville, Connecticut

Lyndon Lee, Vice-President, Lifetime Sports Foundation, Washington, D.C.

Richard McWaters, Chairman, Physical Education and Health, Roosevelt Senior High School, Minneapolis, Minnesota

Bill Noonan, Director AAHPER, Lifetime Sports Education Project, Washington, D.C.

Sam Reuschlein, Michigan State University, East Lansing, Michigan (Co-editor)

Alice Struzinsky, Douglass College, New Brunswick, New Jersey

Nelma Williams, Rogers High School, Rogers, Arkansas

Joe Zok, American University, Washington, D.C.

In the present guide liberal use has been made of ma-

terial from two earlier publications: "Ideas for Bowling Instruction," and the *Gym-Bowl Instructional Manual*. Grateful acknowledgement is made to the various contributors of the original materials, which have been extensively revised for this publication: The American Bowling Congress for the use of their reference material, *History of Bowling*, and *Equipment and Bowling Lane Specifications*; the American Machine and Foundry Company; and the Brunswick Corporation. Other cooperative organizations that should be acknowledged include the Bowling Proprietors' Association of America, the Women's International Bowling Congress, the Athletic Institute, and the NCAA Film Service.

Carl A. Troester, Jr.

Carl A. Troester, Jr.
AAHPER Executive Secretary

Contents

1 Introduction 7

2 Bowling for Elementary Students and Special Students 10

3 Bowling Equipment and Specifications 19

4 Bowling Etiquette and Safety 22

5 Basic Fundamentals of Bowling 24

6 Class Organization, Teaching Methods, and Instructional Aids 31

7 Scoring 45

8 Intermediate and Advanced Skills of Bowling 49

9 Evaluating and Testing 60

10 Administrative Concerns 68

11 Bowling Opportunities 76

12 Success Stories 82

13 Glossary of Bowling Terms 84

14 Useful References 91

Appendix A: Brief History of Bowling 93

Chapter 1
Introduction

The purpose of this guide is to present important ideas, concepts, and methods for teaching bowling to a wide range of students from the elementary school child to the college student. This bowling guide has been specifically developed to aid the physical education teacher in teaching the skills of bowling in a school gymnasium or in a teaching station with limited space. It emphasizes teaching methods, materials, and skills in a sport in which lifetime participation is the goal. In this manual considerable information is presented concerning the organization of large groups, the use of adapted equipment, and other innovations which make possible the teaching of bowling in limited indoor space.

The guide is based on an eclectic approach and especially emphasizes methodology, class organization, techniques, teaching aids, and other information that is requisite for successfully teaching the skills of bowling in an effective, efficient manner. The material presented herein is adapted from teaching methods that have proven successful in a variety of situations and for a wide range of students. However, the intention has not been to claim any one teaching method as best but rather to present two or more methods for each learning situation in order that the bowling instructor can select those that work best for him in a given situation, whether it be teaching a small class of young mentally retarded children in a hallway or teaching a large group of high school seniors at a bowling center.

Teachers are in need of materials which assist them in class organization techniques, in utilization of limited space and/or equipment, and in identifying teaching aids and various innovations. This guide represents an effort to collect some proven and effective approaches to bowling instruction. It is a combination and refinement of the initial "Gym-Bowl Instructional Manual" and the "Ideas for Bowling Instruction Manual." Subsequent revisions will reflect other successful ideas and programs.

Because individual differences do exist, several approaches should be used by the bowling teachers in order to create a favorable learning climate for all pupils regardless of their bowling background, learning aptitude, and other pertinent factors. The committee is fully aware that in the performance of bowling skills and their components, as for all types of physical activity, there is no one correct way of performing a skill. In recognition of this truism and in order to best accommodate students with a wide variety of physical and mental abilities and levels of maturity, the user of this manual will often have to utilize several approaches if he is to best serve all the students in a class.

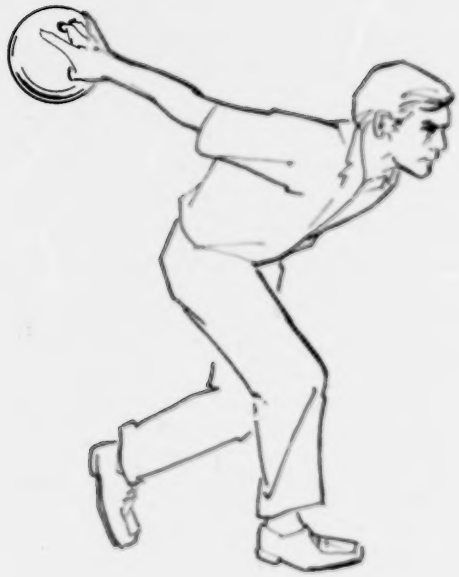
The order and arrangement of the material in this guide follows a sequence that might be used in a unit of instruction on bowling. No claim is made that this is the best order; in fact, there is probably no one best order, in view of all the variables that are involved in the acquisition of bowling skills.

Persons using this guide are encouraged to share their evaluation of its usefulness. Future revisions will reflect these suggestions. Comments should be sent to Lifetime Sports Education Project, AAHPER, 1201 Sixteenth Street, N.W., Washington, D.C. 20036.

WHY BOWLING?

In recent years a national emphasis, first on *physical fitness* and then on *lifetime sports*, has been responsible for significant changes in school physical education and recreation agency program planning. Teacher preparation programs are beginning to reflect an awareness of the growing amount of leisure time confronting Americans at all age levels. The use and related misuse of leisure has become a major sociological problem. The need for instruction in individual and dual sports; family participation in camping, boating and other aquatic activities; and similar programs utilizing community school and recreation facilities, state and national park areas, and *private facilities* has become increasingly pronounced; these activities are attracting greater numbers of participants than ever before. This is a healthy change which *involves* more people in an active role

as compared to the "spectatoritis" so identified with team sports following World War II. Although team sports continue to be emphasized in the preparation of teachers and coaches, most universities and colleges are now focusing increased attention on the so-called "lifetime sports." Bowling is a sport that truly has lifetime implications. It is enjoyed by youth as well as by men and women of all ages. It serves as a social catalyst and therefore has related psychological value. Recreational bowling, league bowling, and tournament bowling present additional challenges of interest to many.



Chapter 2
Bowling for Elementary and Special Students

Children in Primary Grades (K-3)

Since bowling involves rhythm, balance, strength, coordination, and total body movement, it is suggested that for primary grade children activities related to bowling be approached through movement education.

This chapter contains a number of creative ideas, all of which can introduce children in grades K-3 to bowling. The ideas contained in this section were created by public school teachers and have been proven to be useful in individual teaching situations. Any games related to bowling that young children play are the same to them as actual bowling.

Children at the primary level can:

develop a self-awareness and an appreciation of their capabilities in a physical environment;

do a variety of balance activities;

do body movements which include bending, stretching, and reaching;

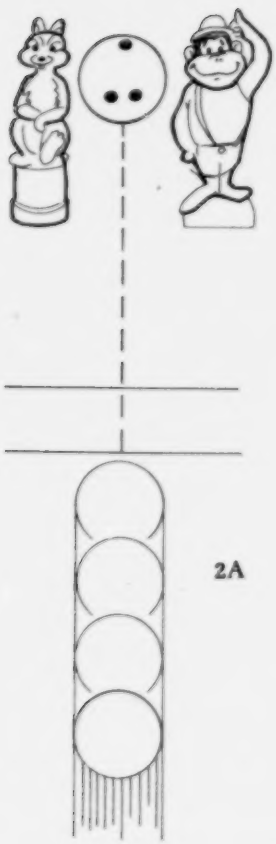
do basic rhythmics such as walking, sliding, skipping, etc.;

do a variety of motor skills such as tossing, catching, and rolling a ball.

The possession of these abilities by children at this level permits them to enjoy many activities related to bowling.

Group Rhythmic Activities

Included here are activities such as walking, sliding, using music or a drum, and combining activities such as walking and sliding, arm swinging, bending, reaching, and stretching to music. It should be noted that walking and arm swinging done to music help to develop the two particular coordinations which are later essential in developing a smooth delivery when bowling.



2A

Movement Education Techniques
The problem-solving method can be utilized to advantage in teaching related movement activities. An example is to ask the question: Can you bend at the waist and reach forward without losing balance?

Can you move high and low or slow and fast, etc.

Practice bending, stretching, and reaching movements in which various body parts are employed.
How far forward can you reach with your arms?
Now reach forward with another part of your body.

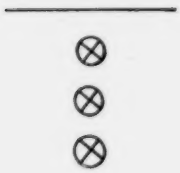
The following questions are also based on problem-solving techniques of teaching.
Can you roll a ball in a straight line to an object?
Can you roll a ball without bouncing it?
Can you roll a ball between two objects?
Do you step forward with one foot when you roll the ball? Which one? Why?

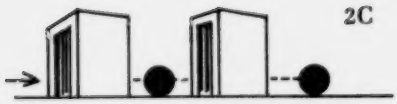
Game Ideas

Roll the Ball at Large Objects (K-1) (Figure 2A)
Place two large road markers, cones, or waste baskets about one foot apart. Have the pupils line up behind a line located approximately six feet from the objects. Using a small rubber ball, softball, or tennis ball, have the child roll the ball between the objects. Observe the pupil's performances to see if he does the following correctly:
Places left foot forward (if right-handed).
Bends and reaches forward to release the ball.
Shows eye-hand coordination.
Children at the K-1 level are not as concerned with scores as with success; consequently, successful performances should be emphasized.

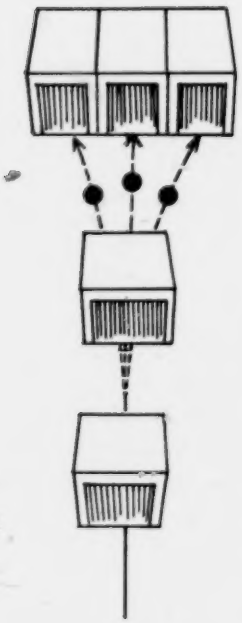
Soakies Are Fun (K-3)
Soakies, plastic containers for children's bubble bath, make excellent bowling pins for small children. Figures of Bugs Bunny, Peter Rabbit, Batman, etc., which are about 10" to 12" high, are available. The soakies are placed along a designated line. The chil-

2B





2C



2D

dren stand behind a starting line located about six feet from the soakies and take turns in rolling a small rubber ball, paper ball or tennis ball, attempting to knock the soakies over.

For variety, the children may take turns trying to knock over different soakies. Children in grades two and three tend to be increasingly conscious of a score; therefore, different point values may be assigned to different soakies. For grades two and three, the starting line should be moved back a foot or two, depending upon the success of the class.

Chlorox bottles make interesting substitute bowling pins, particularly if they are painted a variety of colors. A point value may be assigned each color.

Paper Ball (K-3)

Wad a double sheet of paper or newspaper tightly into a ball. Wrap a second double sheet around the first and continue this procedure until a ball of the desired size is formed. Wind masking tape around the wad while shaping it into a ball. Teach the underhand toss or roll. Use a spot, ring, paper milk carton, etc., for a target. With this ball the following skills can be taught: A pendulum swing, a forward step with the proper balance, coordination between the hand and foot, and a correct follow-through action.

Milk Cartons Used as Bowling Pins (2-3) (Figure 2B)

The object is to knock over the milk cartons with the paper ball. The teacher can create a variety of scoring ideas.

Roll the Ball Through the Box (K-3)

Can you make the ball go through the box? Use a cardboard box with the entire bottom cut out. The child has to roll a ball through the box from a distance of six feet or more. This game is excellent for problem solving since the child finds that he has to bend at the waist in order to accomplish this activity successfully.

Can you make a ball go through two boxes? (Figure 2C) The second box is placed three feet behind the first one and the middle section of this box is removed. Accuracy is emphasized here.

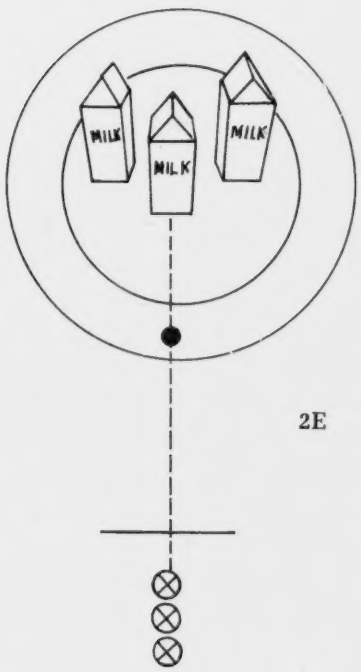
Can you roll a ball through three boxes? (Figure 2D) An increased number of skills as well as scoring (except for K-1) are involved. Box three is divided

into three compartments. A ball passing through various boxes and compartments can be scored in a number of ways.

Intermediate Grades (4-6)

The ideas and equipment utilized in grades K-3 can be adapted to the intermediate levels by the addition of the one-step approach, extending the distance from the starting lines and applying additional scoring situations.

Some group games in which basic bowling skills can be developed and practiced are listed below.



2E

Shuttle Relay (Figure 2E)

This game is useful for teaching the one-step approach.

Equipment: 3 pins and 1 ball for each relay group.

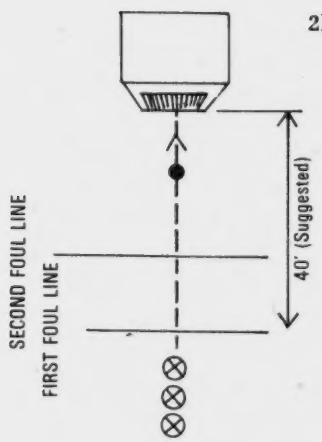
Scoring: Each pin knocked down counts 5 points and rolling the ball through the inner circle counts 5 points. Five points are awarded when a ball lands in the inner circle without knocking down the pins. Two points are awarded for a ball rolled through or into the outer circle.

Knock Them Over—Poison Pins

Equipment: Indian clubs and balls

The players are divided into groups of ten to sixteen. Each group goes to a play area containing end and center lines. Two to five Indian clubs are on each end line. Two teams are formed within each group. One team is assigned to each half of the play space. The purpose of the game is for Team A to bowl over the pins on the line behind Team B and vice versa.

Rules: The players must bowl the ball and stay within their own boundary or court. They cannot step over the center line or run with the ball. The first team that successfully knocks down all the clubs on the opponent's side is declared the winner.



2F

Hit the Target (Figure 2F)

Equipment: One box and two softballs

Object: To bowl the ball into a box

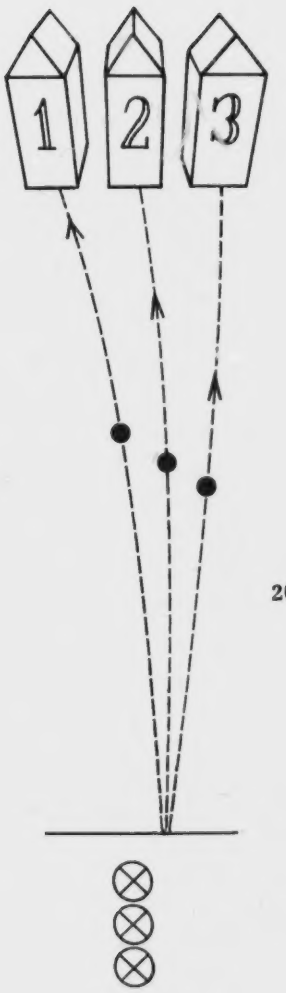
Procedure: The group stands *behind* the first foul line. The first pupil stands on the first foul line, but in making his approach he may not step over the second foul line. Each bowler bowls two balls, attempting to roll them into a box laid on its side.

Scoring: Each ball bowled into the box counts a point

for the bowler. The bowler with the highest score at the end of ten frames (turns) is the winner.

Foul: If the bowler steps over the second foul line, a foul is committed and no point may be awarded.

Bowl in Order (Figure 2G)



2G

Equipment: Three pins and a softball

Object: To knock the pins down in order, starting from the left and going to the right.

Procedure: The pupil so bowls the balls that he knocks down the pin on the left first, then the middle pin, and then the pin on the right. A maximum of three balls may be used per turn.

Scoring: If the three pins are knocked over in the proper order, 10 points; if all are knocked over but not in order, 5 points; if less than three are knocked over, 1 point is scored for each pin knocked over.

After each turn the pupil bowling becomes the pinsetter, and the former pinsetter goes to the end of the line.

Base Bowling

Equipment: Four Indian clubs, one softball

Object: To score individual points by knocking down the pins with the softball.

Procedure: The Indian clubs are positioned in the form of a softball diamond and are numbered in counterclockwise order. The pupil starts behind the approach line and bowls at pin #1. If that pin is knocked over, the pupil bowls at pin #2, while standing on first base. The bowler continues to the next base even if he fails to knock down a pin. The bowler always stands at the base behind the one at which he is bowling (example: when bowling at pin #3, the pupil bowls from second base).

Scoring: 1 point is given for each pin knocked down, four being the maximum score for one round. The bowler with the highest score at the end of four rounds is the winner.

Fouls: Stepping over the foul line or beyond the base area, not bowling the ball, or bouncing the ball. When a foul occurs no point is scored, and the pupil who fouls loses his turn.

Bowling and the Exceptional Child

This sample unit is included as an aid to the teacher who wishes to apply the information and concepts presented in this publication to bowling activities for the exceptional child. The reader can see how the three major areas of concern—fundamental skills and perceptual development, activities of low organization, and activities of a higher order—are integrated into a coordinated whole in the teaching units. The initial emphasis is upon the development of a sound foundation of basic movement patterns and improved motor ability followed by their use in activities that promote skills fundamental to bowling. Next, activities are included that stress the specific components and aspects of bowling. The last step would be active participation in the game of bowling.

Level I—Fundamental Skills and Perceptual Development

Objectives

To develop an awareness of self and the capabilities of the body in the physical environment.

To promote balance through a variety of activities.

To develop basic body movements related to those required in bowling.

To evaluate perception and kinesthetic awareness.

Methods

Exploration of movement involving balancing, bending, reaching, stretching, and other non-locomotor activities.

Rhythmic activities involving the basic movements of walking, running, skipping, sliding, and tossing and catching a ball.

Drills and other formal activities for practicing the basic skills of bowling.

Problem-solving activities.

Games and relays.

Activities

The four objectives of these activities are listed below:

To help the child develop an awareness of the body's capabilities. (The instructor makes suggestions and guides the children through the prescribed activities in a problem-solving approach.)

Make a bridge with your body.
How wide can you make your body?
How small can you make your body?
Make a circle with your right foot.
Make a circle with your left foot.
Find a partner and hold his right hand.
Find a partner and hold his left hand.
Find two people and hold hands.
Walk forward and backward without bumping anyone.
To promote increased balance through basic movement.
Holding the arms sideways at shoulder level, walk forward, backward, and sideways on a line on the floor.
Walk forward, keeping the left foot always in front of the right foot.
Walk forward (backward) keeping the hands on the hips.
Start with both feet together and then "put the left foot over a water puddle" (or "test the temperature of the water in a pool"); "bring the foot back when you discover that the water is cold."
Balance on one foot, extend the other leg back and extend the arms sideward. Close the eyes, attempting to maintain balance. Reverse feet and repeat.
Stand on the left foot with the sole of the right foot resting against the inside portion of the left knee. Close the eyes, attempting to maintain balance. Reverse feet and repeat.
To develop basic movements related to bowling.
Roll the ball to your partner.
Throw the ball to your partner.
Bounce the ball and catch it.
Bounce the ball to your partner.
Place the ball "on the other side of the puddle, without stepping in the water."
Include activities such as agility relays:
Standing behind a line, roll the softball forward with an underhanded motion.
When the ball crosses a second line, run and pick it up.

Roll the ball back to the next person in line who repeats the procedure.
Add variations (e.g., several trips) as the participants increase in skill and agility.

Problem-solving activities.
Can you make the ball hit an animal? From a distance of not more than nine feet have each child roll some kind of ball at a large stuffed animal placed on the floor. Note whether the child places the right or left foot forward, whether he bends at the waist, if the throwing motion is overhand or underhand, and if the ball is delivered with one or two hands. If the child bounces the ball over the object he may, upon questioning, decide that he was too upright or that he needed a smaller ball. (A two-handed throw, a push, or a sidewise rotation of the trunk can be corrected by substituting a smaller ball such as a tennis ball.) Next, each child attempts to knock down ten pins (soakies, paper cups, tape cartons, milk cartons, bleach bottles, etc.) with his own ball. The distance to the pins should initially be between six and eight feet, but it should be sufficiently far to be challenging and yet close enough that the child experiences success.

Level II—Locomotor Skills

Objectives
To use basic body movements in developing fundamental bowling skills.
To have fun!

Methods
Group rhythmic exercises.
Drills and other formal activities for practicing the basic bowling skills.
Problem-solving activities.
Games and relays.

Activities
Group warm-up exercises and rhythmic activities.
Walk (forward, backward, sideways, fast, slow, giant steps, baby steps, scissors steps, ad infinitum).
Walk to the beat of a drum or tom-tom.

Walk and swing the arms vigorously (easily, rhythmically).

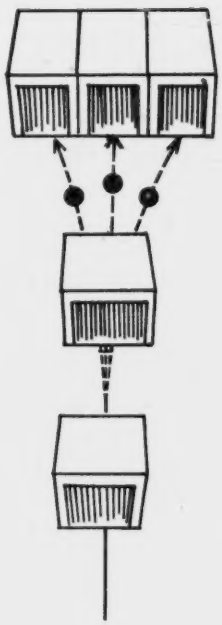
Walk and swing the arms in time to the music.

Bounce a rubber playground ball.

Bounce a ball to the music; keep the foot opposite the ball hand (left if using the right hand) forward.

Ask the children, "Can you make the ball go through the box?" Using a cardboard box with the entire bottom cut out, have the child make a small rubber ball pass through the box. The distance from the box is initially about six feet; vary this distance according to the ability of the child.

Ask the children, "Can you make the ball go through two boxes?" A second box with the middle section of the bottom cut out is placed approximately six feet beyond the first one. Accuracy is introduced as the child attempts to make the ball pass through the openings in both boxes.



Ask the children, "Can you make the ball go through three boxes?" For this activity a third box that is divided into three compartments and placed about six feet beyond the second one is needed. Increased accuracy is required as competition and counting are both introduced into the activity. A ball passing through the various boxes may be scored in a number of ways. The teacher may wish to develop his own scoring system.

Ask the children, "Can you roll the ball to a specific pin?" Pins can be painted a variety of colors and point values may be assigned to each differently colored pin. Activities of this nature, which are suitable for kindergarten and first grade pupils, can easily be adapted for use by children of the lowest ability level.

Level III—The Bowling Approach

One-step approach, aiming for three pins.

One-step approach, aiming for ten pins.

The ideas suggested for junior and senior high school students can be adapted for use by the higher level ability groups.

Additional information on activities for the exceptional child may be obtained by writing to Programs for the Handicapped, AAHPER, 1201 Sixteenth Street, N.W., Washington, D.C. 20036.

Chapter 3 Bowling Equipment and Specifications

Gym-Bowl Equipment

The gym-bowl equipment has been especially designed in order that the fundamentals of ten-pin bowling can be taught in the gymnasium or other available school space, using special equipment for this purpose. The light substitute bowling balls (4 to 6 lbs.) can be safely handled by elementary school children while providing them with the feel of a regular-size bowling ball. The light-weight hollow plastic pins are the same size as regular bowling pins and thus realistically simulate them when bowling instruction and practice is provided in the school situation. A special plastic template is provided whereby the exact dimensions of the approach and its marks, the lane and its range-finder markings, and the pin deck, together with the locations of the pins are shown. The use of the gym-bowl kit will enable the bowling teacher to teach all the bowling skills described in the chapter, "Bowling for Elementary Students and Special Students" and to teach some of the advanced bowling skills described in a later chapter. This equipment can also be used to duplicate and supplement some of the equipment used for the games described in the previous chapter as well.

Sources of Gym-Bowl Equipment

The AAHPER does not manufacture or sell physical equipment such as balls, pins, etc., for teaching gymnasium bowling. It limits its activities to the production of instructional aids such as manuals, filmstrips, placards, etc. The following manufacturers stock and supply gym-bowl physical equipment. The prices listed are subject to change.

3A

BRUNSWICK CORPORATION
69 West Washington Street
Chicago, Illinois 60602

Entire gym-bowl kit	$52.00

Contains: 1 set of 20 plastic pins, 3 balls, 1 roll masking tape, 1 canvas carrying case, and 1 vinyl 10-pin template

Extra balls	$11.50 each

COSOM CORPORATION
6030 Wayzata Blvd.
Minneapolis, Minnesota 55416 $65.00

P. I. K. COMPANY
Martin Drive
Shelby, Ohio 44875
Att: Order Services Department

Entire gym-bowl kit	$52.50

Component parts—price per item:

1 set of 20 plastic pins	$ 7.50 each set
3 balls	11.50 each ball
1 roll masking tape	.75
1 canvas carrying case	5.25
1 vinyl 10-pin template	6.50

Lane and Approach Area (Figure 3A)

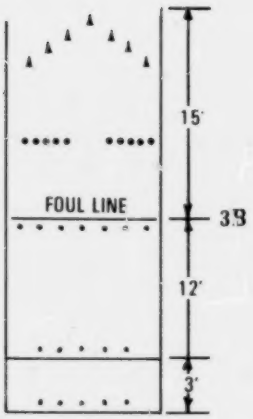
Regular Bowling Equipment

Approach area: The minimum length is 15 feet.

Lanes: Length from foul line to head pin: 60 feet. Length from foul line to pit: 62' 10-3/16 inches. Width: 41 to 42 inches depending on the size of the boards used.

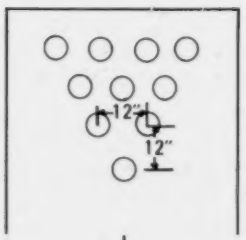
Foul line: Divides the approach and the lane—used to determine if the ball is illegally delivered, thus resulting in a foul being committed.

Channels (gutters): Troughs, approximately 9 inches wide, located on each side of the lane and running its entire length.



Range finder (Figure 3B): The diamonds and dots embedded in the approach end of the lane. On the approach the dots for the 12-foot mark are located 11' 10" behind the foul line and for the 15-foot mark, 14' 10". Another set of dots is located immediately behind the foul line. On the lane 12 to 15 feet beyond the foul line are located seven diamonds arranged in the shape of an upside down arrow. The largest dot and diamond, which are 15 feet from the foul line, are in the exact center of the bowling lane. These markings are in the same position on all bowling lanes. The dots (and diamonds) are spaced five boards apart in width.

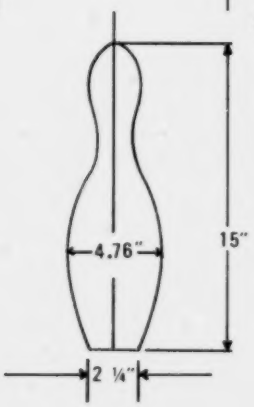
Kickbacks: The side partitions at the pit end, which must be at least 60 inches apart.



3C

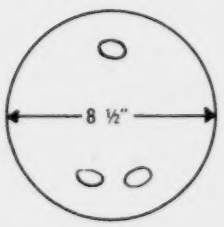
Pins (Figure 3C): The pins are arranged in the shape of a triangle and from center to center are 12 inches apart. It is important that the students learn the system of numbering pins, which is diagramed below.

The standard pin is made of laminated wood and has a plastic covering and base. Its weight can range from 3 lbs., 2 ozs. to 3 lbs., 10 ozs. It is 15 inches in height, has a bottom diameter of 2 inches and at the widest point is approximately 4.766 inches in diameter.



Bowling balls (Figure 3D):
Minimum weight: none
Maximum weight: 16 pounds
Circumference: 27 inches
Diameter: Approximately 8.59 inches
Balance: The ball must be in proper balance on no less than six sides.

Any number of holes may be drilled in a bowling ball, provided that the ball remains balanced or is rebalanced.



3D

Bowling shoes: Bowling shoes are normally the same size as the street shoes worn by the bowler.
bowler.
Bowling shoes have white rubber heels, and if right-handed a rubber sole on the right shoe and a leather sole on the left shoe. (Both soles of rental shoes are leather in order that they can be used by either left- or right-handed bowlers.)

Chapter 4
Bowling Etiquette and Safety

Safety When bowling in the gym, special shoes are not required. Instead, the pupils should wear sneakers, either removing the one on the foot that slides during the delivery or covering it with an old sock. A gym bowling ball rolling on the floor should not be stopped with the hands; instead, the ball should be stopped by the upturned sole of the foot, while keeping the heel in contact with the floor.
When bowling at a bowling center a bowling ball should be allowed to come to rest in the ball return rack before it is picked up. At all times it should be picked up with both hands, one on either side of the ball in order that neither hand can be bumped by another bowling ball.

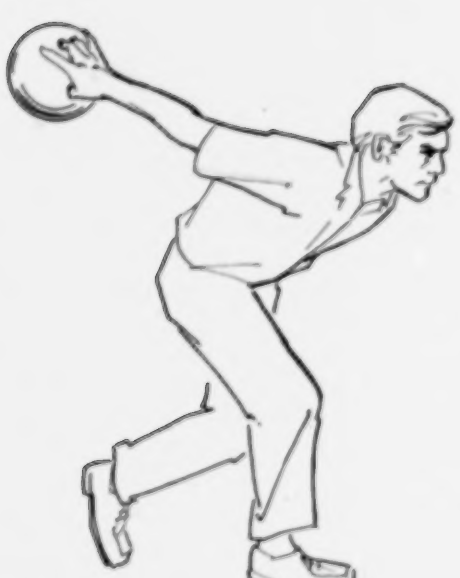
Etiquette Good bowling manners consist of just two basic things—common sense and common courtesy. Use them and you will get more enjoyment from your bowling, whether you are in the gym or in a bowling center.

The correct bowling etiquette will speed the game and increase its enjoyment. Do not be a "lane hog"; after delivering your ball, confine your "body English" to your own lane. Be ready to bowl when it is your turn; do not waste time. The bowler on the right has right of way. If he is in the ready position, step back and stay out of his line of vision. Stay in your own approach area. Walk away from the foul line after your ball has reached the pins—thus freeing the approach for the next bowler. Remain seated until your turn to bowl arrives. Be considerate of the other persons who are bowling in your and the adjacent lanes. Encourage your teammates when they bowl. Have fun and be a good winner or a good loser, but remember bowling is a sport that is meant to be enjoyed by all.

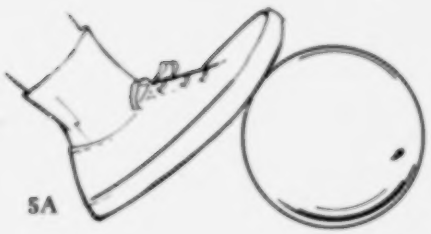
Loud talk, boasting, bragging, heckling, swearing, or griping -- have no place in any sport.

Attire

Comfort and freedom of movement are the prime considerations in selecting suitable bowling attire. Men's shirts and trousers should so fit that they permit freedom of movement, especially across the shoulders and under the arms. Tight slacks and trousers should be avoided. Sweaters or loose-fitting blouses are fine for girls. Tight or billowing skirts or slacks hamper the delivery.



Chapter 5
Basic Fundamentals of Bowling



5A

The instructions in this and all succeeding chapters are given for right-handed bowlers; therefore, the instructions must be reversed for left-handed bowlers.

The Gym Bowling Ball

The 4- to 6-pound gym bowling ball is lighter than a regular bowling ball, which usually weighs from 12 to 16 pounds. The gym bowling ball has two sets of three finger holes, one set for larger hands and one set for smaller hands.

5B

5C

Handling the Gym Bowling Ball

Stopping the ball (Figure 5A). As the ball rolls toward the bowler, it should be stopped with the raised sole of one shoe, keeping the heel in contact with the floor.

Lifting the ball (Figure 5B). Both hands should be placed on the sides of the ball, lifting it to a comfortable position that is approximately waist high (Figure 5C).

With the left hand supporting the ball, the middle and ring fingers should be placed into their respective holes. The thumb should then be placed all the way into its hole (Figure 5D).

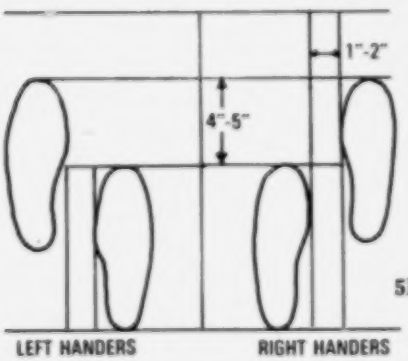
5D

One-Step Delivery

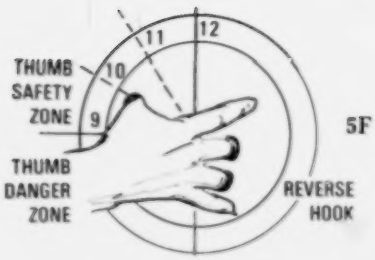
The following skills should first be individually practiced without either moving the feet or using a regular or gym bowling ball; next, with a ball; then finally with a one-step approach and a ball.

Starting Position (Stance)

Foot placement (Figure 5E). The feet should be parallel to each other and approximately one to two inches apart, with the right foot (right-handed bowler) approximately four to five inches forward of the left foot.



5E



5F

Hand and arm position (Figure 5F). The bowling arm is fully extended with the hand in a hand-shake position. In relationship to a clock face the thumb is at the 10:00 o'clock position. The maintaining of this rather natural hand position throughout the delivery will result in a ball delivery known as a "hook," especially if the right hand is forcefully lifted during the release of the ball.

5G

Body position (Figure 5G). The shoulders should be level and facing squarely toward the intended target. The knees are slightly bent and in a comfortable position; the body is bent slightly forward from the waist, with the weight resting mainly on the forward foot.

Pendulum swing (from the starting position) (Figure 5H)

The fully-extended arm should hang naturally at the side with the wrist straight.

With the weight on the forward foot, and the body bent slightly forward, the bowling arm should swing forward to eye level. The arm should then swing downward and backward in a natural arc to a height somewhere between the waist and the shoulders. As the arm swings forward, the opposite foot should be brought forward in a slide. For proper timing and control, the bowling hand and the opposite foot must come forward at the same time. The complete movement should be practiced until it feels natural.

5H

Pushaway (Figure 5I)

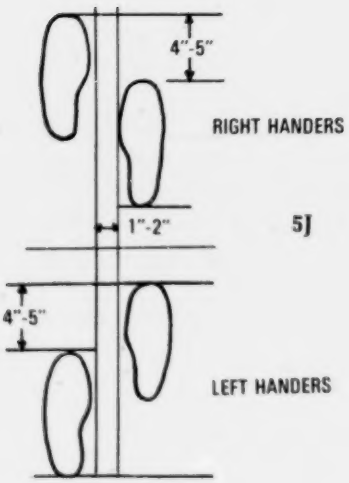
The feet and body are positioned as for the pendulum swing.

The proper position of the hands is attained by a right-handed bowler by moving the right hand from the "handshake" position inward toward the body. The left hand is under the ball, helping to support its weight. The ball is held approximately waist high with the elbows tucked into the hips.

5I

The ball is shifted to the right (right-handed bowler) until it is in front of the right shoulder in which location a straight pendulum swing from the shoulder can be best achieved.

The proper body position is maintained with the knees bent and the weight mainly on the forward foot.



5J

The ball is pushed forward (out) and downward and the left hand is removed from under it in order that the weight of the ball may initiate the pendulum swing of the extended right arm. This motion should be a smooth continuous action.

After the ball completes the arc of the backswing and starts its forward motion, the opposite foot also simultaneously comes forward into a slide, and the ball is rolled forward toward a target located on the floor.

Four-Step Delivery

The four-step delivery is begun from a starting position different from that used in the one-step delivery.

Foot Placement (Figure 5J)

The most commonly used foot placement is one with the feet parallel with each other and spread one to two inches apart. The left foot is approximately four to five inches forward of the right foot. A comfortable individual placement of the feet should be the goal.

5K

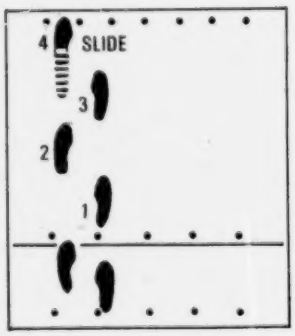
Body Position (Figure 5K)

The shoulders should be level and square to the intended target. The legs are slightly bent at the knees and are in a comfortable position. The body is bent slightly forward from the waist, with the weight resting mainly on the forward foot.

The Four-Step Walk (Without Ball)

The pupil should step forward with the right foot (if right-handed) taking four walking steps ([1]right, [2]left, [3] right, [4] left). The action should be smooth and rythmical and should not involve fast nor large steps. The first step is less than normal in length with the succeeding steps gradually increasing in length.

As the pupils practice the four step delivery, the teacher and/or the pupils may say "1 - 2 - 3 - slide" or "shuffle - walk - heel - toe" as an aid to achieving the proper timing.

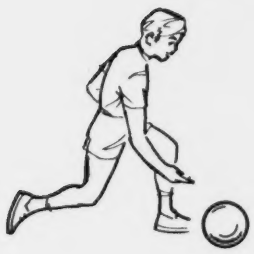


5L

The Sliding Step (Without Ball) (Figure 5L)

The four-step walk is repeated, making the fourth step a sliding step—right, left, right, and then the left foot is brought alongside the right foot and pushed forward in a sliding movement.

At the completion of the sliding step, the full body weight should be on the sliding foot, the leg bent at the knee joint, and the shoulders perpendicular to the line of the forward foot, which should be pointed directly toward the target (Figure 5M).



5M

Coordination of the Arm Swing and Foot Work

The student should first practice without a ball

There are four counts in the arm swing—(1) out, (2) down, (3) back, and (4) forward (bowl) or (roll). There are also four counts in the walk—(1) right, (2) left, (3) right, (4) slide (left). In order to have the proper timing in the coordinated delivery, the ball must be started in motion at the same time that the first step is taken. Putting together each count of the arm swing and the steps produces "timing," that is, the ability of the bowler to take and complete simultaneously the last step and the ball release. The coordinated arm swing and footwork involves the following:

Assuming the "starting" position for the four-step walk.

Proper foot placement (left foot forward)

Body position (check previous description)

Position of the hands and arms as described for the pushaway.

With the weight on the forward foot, the pushaway is stressed as the right-handed pupil steps forward on the right foot. The starting motion of the ball and the step must be simultaneous. At this point the supporting left hand releases the ball.

As the student steps forward with his left foot (second step), the ball should be approximately alongside or just behind the right leg.

As the student steps forward on his right foot (third step), the ball should be completing its natural arc at the end of the backswing.

As the student prepares to take the fourth step (slide), he should bring the left foot alongside the right, push it forward and slide. At the same time, the ball is moving forward toward the release point. The foot and hand motion should be completed at approximately the same time. The ball is released as the hand begins its upward movement. The hand con-

5N

tinues to move forward and upward to about shoulder level in a natural follow-through action in which the arm is bent at the elbow joint.

During the fourth step the foot bearing the body's weight should be perpendicular to the shoulders and pointed toward the target. The shoulders should be above or slightly ahead of the sliding foot. In order to maintain the balance, the other foot is on the floor to the rear of the body and the arm opposite the bowling arm is extended to the side (Figure 5N).

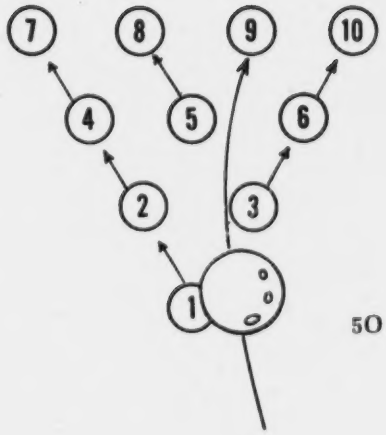
The coordination for the four-step delivery can be practiced in two ways—(1) the separate-steps analysis and (2) the total-movement presentation.

Separate-Steps Analysis (Part Method)
The complete movement is performed, but the student stops after each count in order that the relative position of the feet and the bowling hand may be observed.

Total-Movement Presentation (Whole Method)
The student assumes the starting position and then simultaneously places the body and the ball in motion. He continues through the complete arm swing and the four-step approach without pause.

Fundamentals

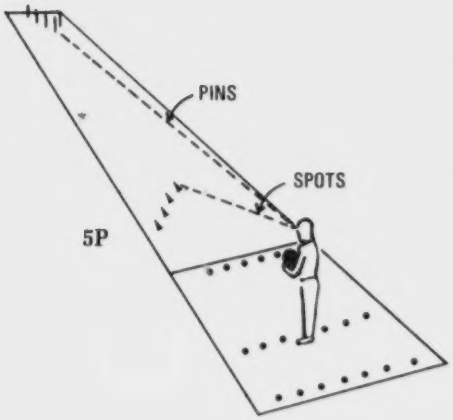
No two people bowl exactly alike. Only practice, coupled with the basic theory, will teach a bowler to adapt his delivery in order to obtain a maximum number of strikes and converted spares.



5O

Starting Distance from Foul Line
With his back to the pins the student takes a position with his heels six inches from the foul line. He then takes a normal four-step approach (or else takes 4-½ steps forward) and notes the spot on the approach where the sliding foot ended. This is the distance from the foul line at which he should assume his starting position. The student should then do his regular four-step approach and deliver the ball. He may find that he needs to adjust his distance somewhat.

Pin Action on a Perfect Strike (Figure 5O).
On a perfect strike hit by a right-handed bowler the



5P

ball actually hits the 1, 3, 5, and 9 pins. The 3 pin hits the 6 and the 6 hits the 10 pin. The 1 pin removes the 2, the 2 hits the 4, and the 4 hits the 7 pin. The 5 pin is driven into the 8 pin and the ball is deflected into the 9 pin.

Methods of Aiming (Figure 5P)

Regardless of the aiming method utilized, the pupil should approach with his shoulders aligned squarely with the intended target.

Position bowling (focus of sight – target (pins or arrows))

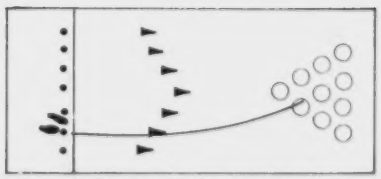
5-pin or strike angle (center-to-center angle) – the starting position is from the center of the approach. The pins involved are the 1-3-5 pins in any combination.

Spare angles

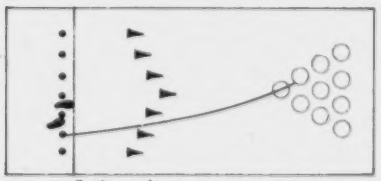
7-pin angle (right-to-left angle) – the starting position is from the right side of the approach and the pins bowled at from this angle are any one or combination of the 2, 4, 7 and 8 pins.

10-pin angle (left-to-right angle) – the starting position is the left side of the approach. The pins bowled at from this angle are any one or any combination of the 3, 6, 9 and 10 pins.

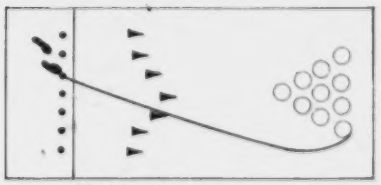
5Q



Strike angle 1-5 pin spares



7-pin angle



10-pin angle

Spot bowling (focus of sight – range finders) (Figure 5Q)

Strike angle (center-to-center) – starting position is the middle portion of the approach. The ball should travel over the second arrow (target finder) from the right channel.

Spare angles

7-pin angle (right-to-left) – the starting position is from the right side of the approach. The ball should travel between the second and third range finder (arrow) from the right channel. The 4 and 7 pins are involved.

10-pin angle (left-to-right) – the starting position is from the left side of the approach. The ball should travel over the third range finder (arrow) from the right channel. The 6 and 10 pins are involved.

5-pin (strike) angle—the starting position is from the center of the approach. The ball should travel over the second range finder (arrow) from the right channel. The pins involved are the 1, 2, 3, 5, 8, and 9.

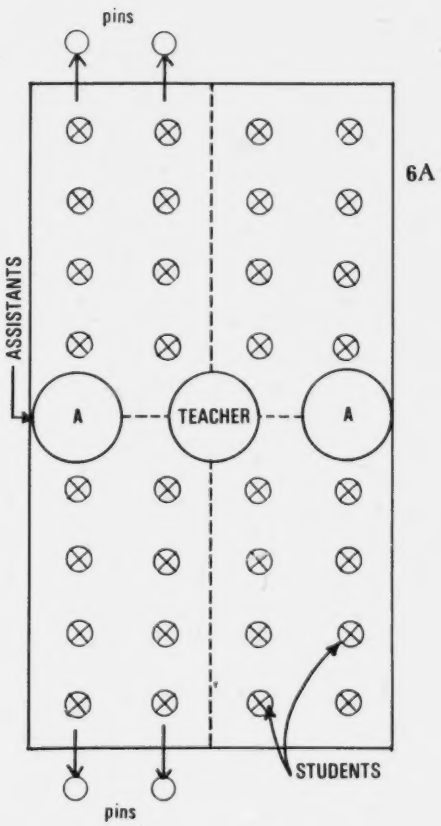
For the 2 and 8 pins, the second range finder from the channel remains the target; however, the bowler may need to position his body more to the right of the approach. For the 3 and 9 pins the target remains the same, but the bowler may need to position the body more to the left than usual.

Chapter 6
Class Organization, Teaching Methods and Instructional Aids

Class Organization

Class organization and teaching approaches in gymnasium bowling are most effective when many or all of the students are kept active through a variety of organizational patterns. Presented in this chapter are effective approaches and efficient organizational patterns by means of which the students can learn the fundamental skills of bowling, practice them through game activities, and also develop skill in bowling techniques with the aid of simulated bowling lanes located in the gymnasium. Although there are many possible organizational patterns, only a few of them are outlined here.

One of the main concerns is to teach the one-step and the four-step approaches, which are essential to the development of bowling skill. The basic fundamentals can be taught with the class in the following organizational patterns:



Pattern A (Figure 6A)

This formation has a desirable visability pattern. The teacher can place himself (herself) at any side of the gymnasium and be able to see and be seen by his (her) students. The center of the gymnasium gives the teacher a good vantage point from which to see and teach any group easily.

Pattern A is a functional practice organization. Without extensive class movement the class can work in the following ways:

By having one group facing the other, the students can work as partners.

Squads of four can turn to the sides of the gymnasium to practice toward the perimeters of the gym.

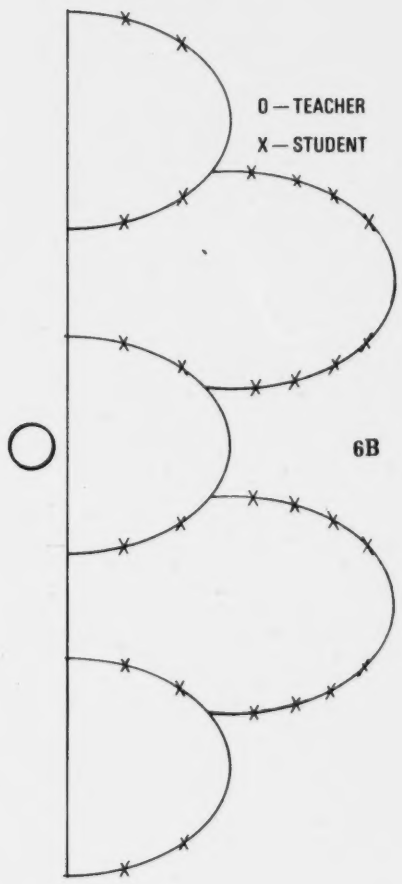
By facing toward the interior of the room the class can work as groups of eight.

Many groupings are possible—the teacher should use the smallest grouping possible in accordance with the equipment available.

Pattern A has the additional advantages that
it can be used for ability grouping and
it has many safety features—especially when the group works toward the perimeter of the room.

Pattern B (Figure 6B)
This formation effectively concentrates the students for both teacher and student visibility. It is most effective for a large class located in a small area. Almost everything that can be done while in Pattern A can also be accomplished when utilizing Pattern B.

Basic Teaching Methods



Some controversy exists concerning whether the part method, the whole method, or some combination of the part and whole method is the best approach to teaching skills. Generally, the whole method is considered to be the most efficient and effective method, when the whole is defined as the largest part which the learner can assimilate. The size of this whole ("largest part') is determined by the complexity of the skill and the ability of the students. If a skill is so simple as to be easily presented as a whole, it is an inefficient use of time to present it in parts. Many skills, however, are complex and must be broken into parts in order for the students to remedy poor or erroneous performance in some of these parts. However, for such complex skills the whole activity should first be presented to the students in order that they will have a clear concept of the whole, and see how the parts fit into the whole. This gives meaning and purpose to their practice of the parts. An introduction to the whole can also emphasize to the students their lack of ability and their need for practice. It can also indicate to the teacher in what parts the students need the most instruction. In some cases the activity may be too complex to introduce it as a whole to the students by any other way than the use of audiovisual techniques.

An example of the part method of teaching would be the teaching of the pendulum swing without using

the four-step approach, whereas the whole method would combine the four-step approach and the pendulum swing, complete with the ball release and follow-through. An example of the whole-part-whole method would be to present the whole skill—the coordinated movements of the pendulum swing and the four-step approach—and then break it down into its parts; that is, the four-step approach, for practice, and then put it back together into the total coordinated movement.

Movement exploration, or the problem-solving approach to teaching bowling, can also be very effective at the elementary school level. In this approach the student is placed in a learning situation which has been carefully planned and thus, under the guidance of a teacher, he experiments with different solutions to movement problems. It is not the old concept of the inefficient trial-and-error method of learning, but rather it is more aptly described as guided discovery. If the teacher plans carefully and guides the student's progress, the student can discover things for himself without wasting a great deal of time. Students find this discovery learning to be more meaningful and therefore retain this material for an increased period of time. The teacher can guide this learning by designing learning problems, the solutions to which will result in learning the appropriate knowledge and techniques of bowling. An example of this type of approach would be to have the child roll a ball through a box, which has a portion cut out of it in order that a rolling ball could pass through the opening. The child will learn that he has to bend at the waist in order to roll the ball smoothly, thus preventing the bouncing of the ball, which would not permit it to pass through the opening. This problem-solving technique can also be utilized by asking questions of the students. Some sample questions are as follows: Can you roll a ball without bouncing it? Can you bend at the waist and reach forward as far as possible without losing your balance?

Methods Involved in Teaching Bowling

The bowling instructor must discover the extent to which the students have mastered the various skills of bowling. After this evaluation has been

completed, the progression of skill instruction and the methods of teaching must be determined.

Skill Progression
The chapter on fundamentals is written with a skills progression that goes from the basics through the one-step approach and proceeds through the four-step approach. While other skills progressions exist, the authors recommend this progression.

Teaching Aids
Rhythmical approach—use $\frac{4}{4}$ music or tom-tom to get a smooth four-step approach

Video tape—can be used for both demonstration and as a replay for a correction aid

Films and film loops

Overhead projectors

Posters, pictures, and bulletin board materials

Suggested Teaching Techniques

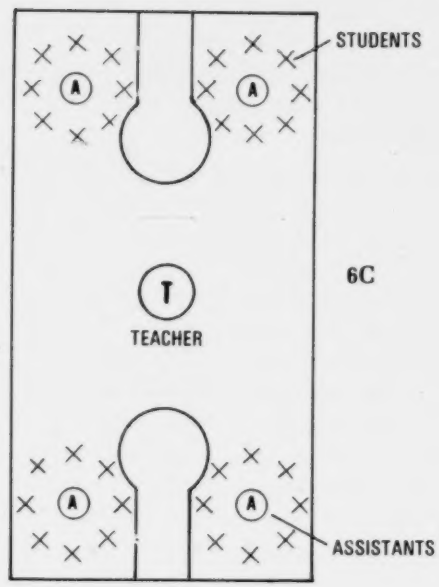
The Basic Fundamentals Involved in Bowling: One- and Four-Step Approach
The students can be taught to bowl by part analysis, by smooth coordinated total movement, or by both in combination. The teacher performs the one-step or four-step approach as a complete skill (total movement) or in part. The student observes the teacher's performance, and in turn performs the observed skill. The teacher observes the student's performance which is then analyzed and corrected.

A teacher may utilize the following teaching techniques in which a student responds to a count—in part or with a total complete movement.

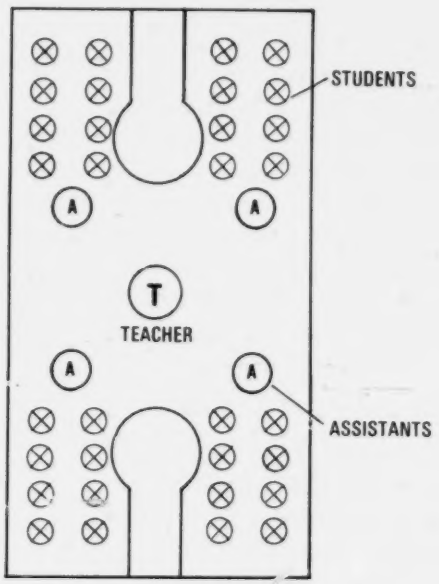
A rhythmic approach, using $\frac{4}{4}$ music, drums, or tom-toms for the coordination of the pendulum arm swing and release along with the walk and slide (or the coordinated whole movement), is also helpful in teaching the four-step approach as a total coordinated movement. With his partner the student now practices the skills without and with the ball. The buddy system can be used in which the student actually takes the partner through the movement by doing it with him and observing and correcting the partner's errors. The partners stop and return the ball for each other. The demonstration is reviewed with questions and answers.

Teaching stations may be organized and utilized to assist students having difficulty, as depicted by Figures 6C and 6D.

Teaching Hints



6C



Immediately after skills have been presented, the teacher must allow the students time in which to practice the skills while the instructions and demonstrations are still clearly in mind.

When practicing skills that involve using equipment such as balls and targets, the student should not be forced to simulate practice without this equipment for a very long time before being allowed to utilize this equipment in his practice. The student should first roll the ball without a target, and work only on the coordination of the skill. To use the pins at first would be distracting. However, the target should not be withheld for too long a period of time, or the student may lose interest.

The distance between the target area and the foul line, and the number of pins or objects serving as targets should be modified according to the ability level of the students.

Teams should be comprised of as few class members as the amount of equipment, number of students, and facilities will allow, thereby affording maximum student participation.

The teacher must observe, analyze, and criticize the students' performances in order that they might know what they are doing wrong, and why, and how to correct their performances. It might be better to "praise" first and then criticize. Different students will react differently to varying amounts of praise and criticism, but all students must be appraised of their progress. An example could be: "That was much better, Mary, but you still need to bend more at the waist."

Motivating devices must be utilized to stimulate and maintain student interest in bowling. Different activities and teaching techniques can add variety to the program, which will help to maintain this interest.

The students should work on only a few details at a time or else some of them may become confused.

The students must first be introduced to the whole

concept of bowling in order that the segments will have meaning to them.

Students must establish realistic goals which they can pursue. In order to establish these goals, the subtle guidance of the teacher is needed.

The teacher can use the "buddy system" of teaching in which the students can work in pairs, helping each other with their performance. This will help the students develop the ability to analyze performance.

The students should be given opportunities to ask questions, and the teacher should also frequently ask review questions of the students.

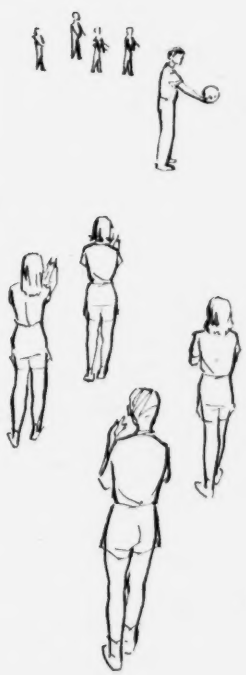
Teaching stations may be used to have students of varying abilities working on different skills at the same time. Several stations may be set up in the gymnasium, enabling more individualized instruction to be conducted. In some cases, students of like ability will work together, thereby progressing at a more rapid rate than with heterogeneous grouping. However, some grouping using well-skilled and poorly-skilled students will allow the better students to help the slower students. This has the advantage of developing leadership in the good students and giving increased help or tutoring to the poor students.

Bowling instruction holds many possibilities for the use of audiovisual aids. Films can be used to present the whole concept of bowling before the students practice on some of the parts. The overhead projector can be used to demonstrate scoring, and many sequence pictures, charts, and other material are available for use on the bulletin board for instructional and motivational purposes.

Learning is a "doing phenomenon"; therefore, students must be given plenty of time to practice the activity in order to develop any degree of skill. A good guide for teachers to follow is—brief demonstration, brief explanation, and "lots of practice."

Teaching Methods

In addition to the teaching methods and techniques discussed in conjunction with the movement education approach, the movement exploration approach, the problem solving approach, the part method, the whole method, and the whole-part-whole method,



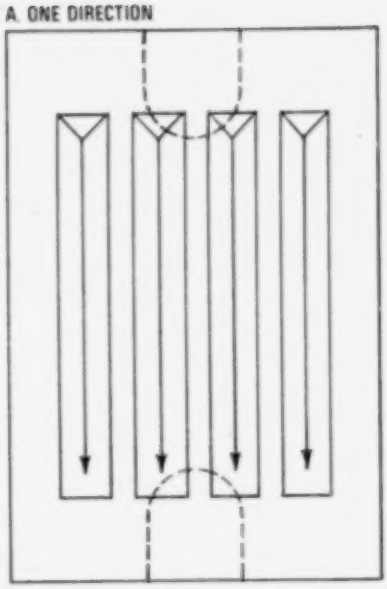
many other teaching methods and techniques may be used in a variety of combinations in teaching bowling skills. A brief definition and an example of each of these methods and techniques will be given merely to suggest ideas to the teachers. Each teacher must decide which methods will work best for himself (herself) when teaching the various skills of bowling and when teaching children of different age groups.

The lecture or explanation method may be quite effective if used wisely. It must not be over-used, however, as it could consume most of the teaching time for any given class period and thus result in the students' receiving an insufficient amount of activity. Explanations must be clear and complete, however. This method has the advantage of allowing the teacher to assimilate, organize, and utilize materials from a variety of sources, ones which can be presented to the students in a meaningful and interesting manner. The lecture method can be effectively combined with the use of demonstration techniques and supplemented with audiovisual material to present information on skill performance, scoring, etiquette, and numerous other aspects of bowling instruction.

The demonstration method is most often combined with the lecture method wherein a teacher, or preferably a well-skilled student, will perform the skill for the class to observe while the teacher gives an explanation of the skill. When someone other than the teacher is demonstrating the skill, the teacher is free to direct the learning situation with increased effectiveness. The demonstration might also be given by a resource person, for example, a local person who is an expert bowler. A further concept of demonstration involves the use of the audiovisual materials to illustrate or demonstrate one facet of bowling. Any bowling skill can easily be demonstrated in any of the above ways at either the gymnasium or the bowling center.

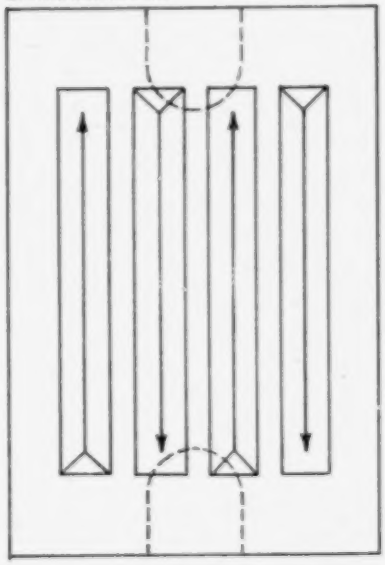
The recitation method may be effectively used as a review technique to reinforce previous learning. Questions concerning the rules, scoring, etiquette, skill techniques, etc., may be asked of the students

A. ONE DIRECTION



6E

B. TWO DIRECTIONS



to see if they are learning the material which has been presented. This technique may be used at the beginning of the period as a review of the work of the previous day in order to refresh the students' memories, or it may be effectively used at the end of the period to reinforce their learning of the material before they leave the class. This is often done in the elementary schools while the students are lining up at the door, awaiting their return to their classroom. The recitation method can also be utilized at any time during the period, either with individual students or with the entire class. Frequently this may be done without interrupting the class activity.

The kinesthetic method of teaching might be described as "assisting the student through the movement" in order that he can "get the feel of it." In teaching the pendulum swing, it is sometimes necessary to grasp a student's wrist and guide his arm through a proper pendulum swing until he "gets the feel" of the correct form and timing.

The response-to-command method may be used in teaching an activity or skill that is comprised of several parts, which parts must be performed in the proper sequence and timing. An example of such a skill is the pendulum swing. The teacher may count the cadence for the pendulum swing, 1out, 2down, 3back, and 4forward (bowl), while the students respond by performing the total skill in rhythmic sequence. The same procedure could be used in relation to the cadence for the four-step approach: 1 right, 2 left, 3 right, and 4 slide (left).

The directed study method utilizes outside-of-class reading assignments in bowling books, sports activity books, or in mimeographed hand-out materials prepared by the teacher. The students may be instructed to study the history, rules, equipment specifications, definitions of terms, and other such topics outside of class, thereby conserving class time for increased participation in the activity itself. The use of this method does not relieve the teacher from the obligation of teaching or reviewing this information during class time, but will make this classroom teaching more efficient and effective.

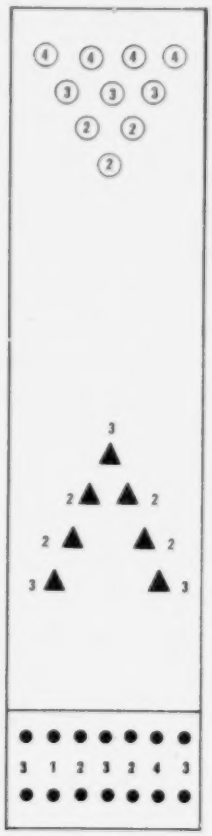
The directed practice method utilizes outside-of-class participation in bowling as an assignment.

Students may be directed to bowl a line or several lines and turn in their score sheets. Outside-of-class competition may also be directed on a scheduled basis.

The project method of teaching might be utilized in a unit on bowling by having the students undertake projects designed to increase their knowledge of and skill in bowling. Such projects might include making bulletin board materials, collecting improvised bowling materials, or creating bowling-type games.

Gymnasium Lane Lay-Outs

When students are placed on the simulated lanes in the gymnasium, they will begin to develop skills which may be further improved when instruction progresses to the bowling center. The student must roll a ball, utilizing his new-found skills as soon as possible. At first he can roll the ball to a pin or to two or three pins. As the student performs the activity, the teacher should note his skills, body position, and aim. This can be done as a drill, relay, or a game. Combined with demonstrations, the use of audio-visual aids such as slides, films and transparencies will give the student an increased understanding of the component skills of bowling and how they should be performed.



Color diagram to assist in teaching, sight and aiming.

Match color for foot, sight and pin position.

Effective Use of Gym Lanes (Figures 6E & 6F)

NOTE: Lane lay-out can be shortened whenever necessary—also, it is wise to lay-out lanes under bleacher areas whenever possible; going with the boards on floor is much better than going across them.

Lane lay-out A. This lay-out offers the teacher maximum visibility of students bowling and easy access for student instruction.

Lane lay-out B. This lay-out enables the most efficient utilization of time, students, equipment, and area. (The ball is rolled down one lane and is returned by being rolled on the other lane. Thus, the student remains at one end for both bowling and pin spotting.) The distribution of students also provides for maximum safety.

Students at the secondary level can also be profitably instructed in gymnasium bowling. The basic fundamentals learned in the gymnasium are those required for eventual participation at the bowling center. For this reason, gym-bowl equipment should be considered as essential as equipment for other individual sports that are included in the secondary physical education program. With the proper equipment it is possible to set up graded bowling activities that include games in which the skills involved in bowling are used.

Suggested Games, Drills, and Activities

Note of caution to teachers: Be careful not to stress speed at the expense of accuracy.

One-step approach and aim for one pin. Until the one-step approach and the proper release are mastered, no stress should be placed upon the student to concentrate on a target. *Score* a point if the pin is knocked down. The student with the most points at the end of a given time period is the winner.

Teams in class: One-step approach; release the ball; aim at one pin. *Score:* The team with the most points at the end of a given time period is the winner.

Three pins with one-step approach. Give the pins actual numbers—1, 2, and 3. The object is to knock down all three pins. Release and aim are stressed. *Score* one point for each pin felled. With this equipment and set-up many variations can be devised by the teacher.

Four-step approach, aiming for one pin. Stress is placed on the four-step approach. *Scoring* is similar to that used for the previous activities.

Teams in class: Again, the team with the most points wins.

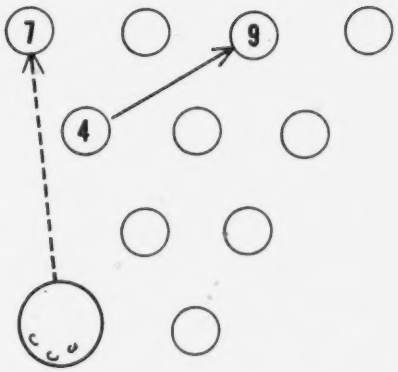
Three pins with the four-step approach. As the student becomes proficient in the skills of bowling, it is possible to set up from three to ten pins and have the students bowl in the gymnasium, using the four-step approach.

To increase skills, another activity which can be included is called "spares." At the high school level, students are aware that each sport has a terminology that is indigenous to it, such as a lob in tennis, a

lay-up shot in basketball, and par in golf. Using the four-step approach, the students bowl at various spare situations which have been set up. The essential terminology of bowlers such as pendulum swing, spare, strike, and frame should be included in the class instruction. Explain the position of the arrows on the lane and their importance to the bowler.

Consideration must be given to class size, available equipment, and interesting approaches with creative ideas in order to keep an entire class constructively active.

Individual Games to Help Develop Skills



Split Down. (Best Done on Regular Bowling Lanes)

Object: To knock down splits.

Procedure: Bowl one ball at each of the following splits: 4, 7, 9; 3, 10; 5, 7; 5, 10; 2, 7, 8; 8, 7, 10; 2, 7; 4, 9; 4, 9, 10; 3, 9, 10. Make only one attempt for each split and proceed to the next split set-up. If several people are on the same lane, each may take his turn at the first split, second split, etc.

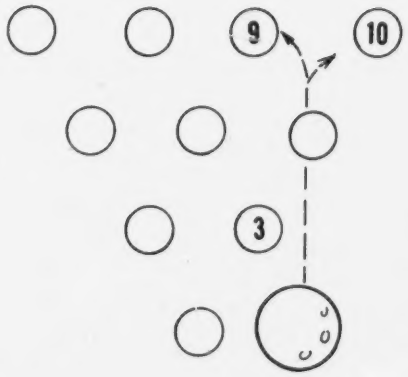
Scoring: Split, if made = 10; if missed = 0. The student with the highest score on each lane is the winner.

Strike or Spare it.

Object: To practice getting strikes or spare.

Scoring: The scoring may be for an individual or for a team. Ten points are given for a strike and five points for hitting the number 10 pin. The person with the highest score wins.

Variation: Any single pin or combination of pins may be spotted after a strike has been made.



Strike or Spare Variation.

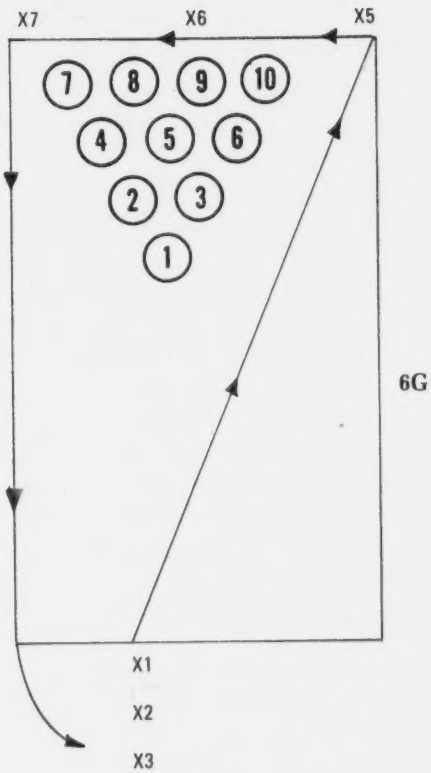
Procedure: Two balls are allotted to each bowler for his turn. All ten pins are spotted and the bowler attempts to score a strike. A strike on the first ball allows the bowler another ball and chance to strike again. If the bowler fails to get a strike, he bowls for a spare. Only strikes or spares are scored.

Scoring: Strike = 10 points; spare = 5 points; the winner is the student first scoring 50 points.

Penalties: Crossing the foul line on the release results in no score for that ball.

Variations: The game total may be changed to suit

the abilities of the bowlers. A time limit may also be used.



6G

X1 - Bowls, then runs to take position of X5

X2 - Watches X1 for errors

X4 - Catches ball from X7 and hands it up the line

X5 - Pin setter

X6 - Pin setter

X7 - Scores the roll of X1, picks up the bowled ball and takes it to the back of the line, giving it to X4

While X7 is running down, X2 is bowling.

Team Games

Win it. The size of the teams should be as small as the number of students, equipment, and facilities permit.

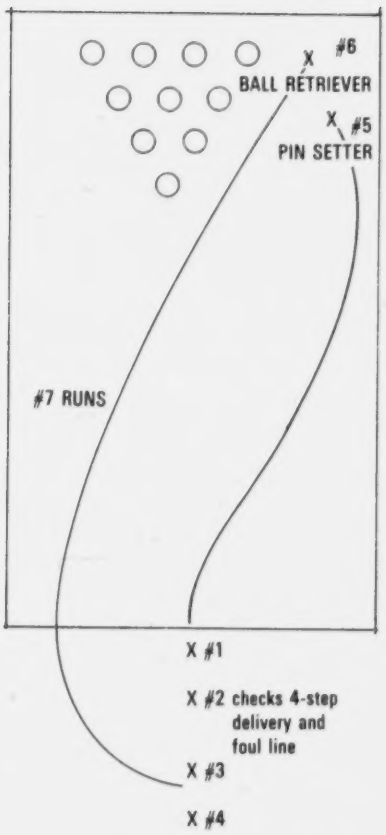
Equipment: Bowling balls and full set of tenpins.
Object: To knock down all pins with the fewest number of rolls possible.
Procedure: When bowled as a team game, each player is allowed one ball for his turn. The first player bowls for a strike. If he fails, the second player bowls for the remaining pins. Then the third player, etc., until all ten pins are down. The pins are not reset until all pins are knocked down.
Scoring: The team with the highest score at the end of a time limit wins. One point is given each time all the pins are knocked down.

Aim Relay

Object: To teach the approach and aim.
Equipment: Five pins and one ball per team.
Procedure: One pin is set up in the lane. The first student tries to knock it down. If he fails, then the second student tries. If the first student succeeds in knocking the pin down, a second student attempts to knock down two pins. This continues until five pins are set up and knocked down. Each student rolls only one ball per turn.
Scoring: The team rolling the lowest number of balls in knocking over the five pins is the winner.
Fouls: Stepping over the foul line during the approach.

Play for Strike

Object: To strike in order to have a chance for a bonus score by hitting the number 10 pin.
Procedure: The first player on each team tries to get a strike. If he succeeds , he may try for the number 10 pin on the second ball. If he fails to make a strike, the next player takes his turn, and so on.



6H

OBJECT: First team to pick up *15* spares wins — take turns as relay #1. If the spare is easy, everyone *must continue* to shoot until he picks up the spare. The first team to make one circuit is the winner.

Bowling Relays

Pin Scoring Practice. (Figure 6G).

Procedure: The first bowler bowls. The scorer records the number of pins knocked down while the pin setters set them up as fast as they can. The second bowler, then third bowler, etc., in rotation. In order to maintain organization, the scorer (X^7) must *hand* the ball to the next bowler at the line.

Fouls: The first bowler at the line *must* complete a legal four-step delivery; otherwise, the delivery is void. The bowler next in line (X^2) observes X^1 to see that he properly executes the four-step approach.

Spare Practice. (Figure 6H)

Procedure: A specific spare is set up and demonstrated. If the spare is easy, everyone must *continue* to bowl until all players have picked up the spare; otherwise, turns are taken as for the previous relay. The bowler acting as ball retriever brings the rolled ball to the back of the line and the ball is handed up the line before being bowled by the next player.
Scoring: The first team to make one circuit is the winner.
Fouls: The bowler at the line *must* complete a legal four-step delivery; otherwise, the delivery is void.

Review

The correct grip and delivery while using the four-step approach and utilizing proper skills and techniques should be reviewed.

Spot bowling. Practice actively on the simulated lanes. Use audiovisual aids such as transparencies to show the spots, range finders, and where the ball should be rolled.

Scoring. Use a blackboard, overhead projector, and transparencies, crossword puzzle, question and answer periods, and student participation.

Suggestions for teaching. When teaching scoring in bowling, the problem technique is recommended. The use of this approach affords the student a direct experience while learning.

Teach the meanings of symbols used on a score sheet such as those for strikes, spares, etc.

Teach the various combinations that occur in a game situation such as two strikes, three spares, tenth frame.

Practice scoring by preparing sample problems teacher-directed with student participation.

Instructional Aids

The proper use of instructional aids will augment the teaching effort and increase student enjoyment as well. The instructor should use all available materials to imporve his presentation, and these in turn will improve the knowledge and learning of bowling skills by the student.

Suggested Aids

Posters, bulletin boards

Bowling techniques
printed by hand/photographs/three-dimensional/ charts/drawings/magazine articles/unusual shapes

Materials
paints (oil and water)/tempera/wood or sticks/ cotton/buttons, cheerios, etc./plastics/marking pens/cloth in many textures/India ink/crayon/paper

Projectors and screens

Filmstrips with sound

Overlays and overhead projector

Slides and slide projector

Movies—8mm, 16mm, 35mm

Loop films and projector

Other

Chalkboard and related supplies

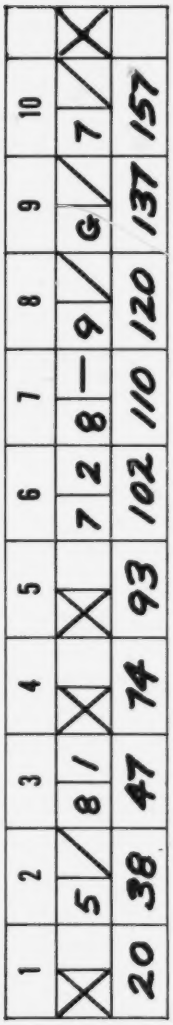
Marking tapes

Score sheets and mimeographed materials

Other marking materials

Specific films and related materials are listed in the bibliography.

Chapter 7
Scoring



1	2	3	4	5	6	7	8	9	10	
X	5/	8/	X	X	7 2	8 —	9/	G/	7/	X
20	38	47	74	93	102	110	120	137	157	

7A

When teaching how to score a game of bowling, the problem technique in which an imaginary game is used to teach symbols, scoring principles, etc., is recommended. In this approach the student if afforded a direct experience while learning.

A bowling game consists of ten frames in which the bowler attempts to knock down as many pins as possible with one or two balls each frame. Three balls are rolled in the tenth frame if a mark is made in that frame. The score is cumulative – the score made in a frame is added to the running total of the previous frames.

Scoring Principles

Scoring involves three basic principles:

If a bowler knocks down all the pins with the first ball rolled in a frame, a strike is made.

If a bowler knocks down all the pins with two balls, a spare is made in that frame.

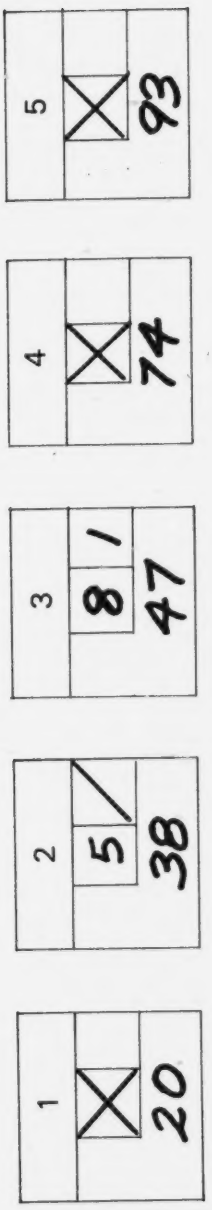
Bonus system. Scoring in bowling involves a bonus system. The bonus for a strike is ten plus the pin fall achieved with the next two balls. The bonus for a spare is ten plus the pin fall achieved with the next ball. A strike/spare or a spare/strike in consecutive frames always scores twenty for the first frame of the combination.

If a bowler knocks down less than ten pins with the two balls rolled in a frame, he merely adds the actual pin count to the running total shown in the previous frame.

The various combinations that may occur in a game situation such as two strikes, three spares, tenth frame, etc., should be taught. These are explained later in this chapter.

Symbols

Teach the meanings of symbols used on a score sheet such as those for strikes and fouls. Use the "lane projector" at the lanes and the overhead projector or chalk board when in the gym or classroom.



Strike	X	All pins knocked down with the first ball in the frame. Value is 10 plus bonus of the number of pins knocked down on the next two consecutive balls rolled.
Spare	/	All pins knocked down with two balls in the frame. Value is 10 plus bonus of number of pins knocked down on next ball rolled.
Miss	-	Did not hit any pins with the ball If pins are hit, but there is no strike or spare, write in the number of pins, e.g., 6.
Split	O	To leave two or more pins standing with at least one pin missing between them and the head pin not standing—give examples of splits.
Foul	F	Give foul definition—counts as ball rolled, no pin count. If first ball, pins are respotted and one more ball is allowed. If second ball, only pins knocked down on first ball count.
Gutter Ball	G	Ball drops into the channel before reaching the pins. No pin count.

Fundamental Scoring Rules (Figure 7A)

Scoring is simple if the fundamental rules of scoring are known.

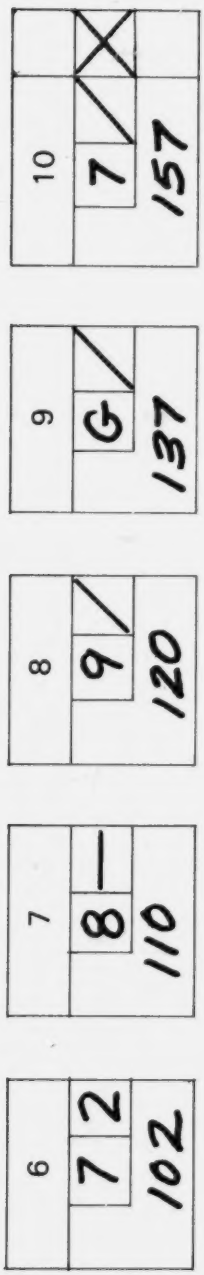
A game consists of 10 frames. Each box on the score sheet represents one frame.

The maximum number of balls rolled in each frame is *two*—see exception in item 6 below.

When less than 10 pins are knocked down with two balls in a frame, the number of pins knocked down by the first ball and the second ball are recorded in the small boxes in the frame.

The total number of pins felled are recorded on the large box in the frame.

If a strike is rolled (knock down all 10 pins with the first ball) a score of 10 is earned, *plus* the number of pins knocked down with the next two balls. The pins fall for these two balls are added to the 10 when the score is computed for that frame. For the second frame, the score achieved in the second frame is added to the first frame's total. The maximum possible score



in a frame is 30—representing three stikes in a row. An "X" is placed in the frame box when a strike has been rolled (see Figure 7A).

If a spare (knock down 10 pins with two balls) is made, a score of 10 is earned, *plus* the number of pins knocked down on the next ball. The maximum possible score is 20—for a spare followed by a strike. The score is entered in the spare frame only after the next ball has been bowled. A diagonal line is placed in the frame box to indicate a spare (see diagram 7A).

In the tenth frame, if a bowler gets a strike on the first roll, he then rolls two additional balls. He is entitled to a score of 10, *plus* the number of pins knocked down in *two* more balls. For a spare, you would get *one* extra ball.

The score for each frame must be added to the running total recorded in the previous frame in order that the game score progressively increases throughout the game.

The students can practice scoring, using sample problems that are teacher-directed with student participation, or the students can prepare their own practice problems for one another. They should be introduced to some of the terms frequently used in bowling such as double, error, foul, gutter ball, mark, split, and turkey. These terms are defined in the glossary of terms, which appears in Chapter 13.

Sample Scoring Problem (Figure 7B)

Frame 1: The bowler starts out strongly with a strike.

Frame 2: He converts a spare this time, with five pins carried on each ball.

Frame 3: He took out eight pins with his first ball, but he left one pin standing after the second ball.

Frame 4: He is concentrating now, and comes up with a strike.

Frame 5: He is right in the pocket again for another strike.

Frame 6: It was 7 for the first roll, and 2 for the second roll.

Frame 7: He carried eight pins with his first ball, but he could not get the two pins left standing.

Frame 8: He is trying again and converts a 9 - 1 spare.

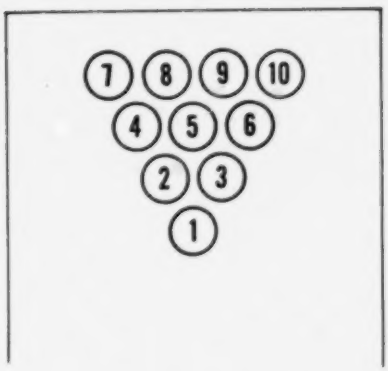
Frame 9: A gutter ball, then a spare.

Frame 10: Another spare, 7 for the first ball, 3 for the second. He is allowed an extra ball.

Extra Ball: He is right on target for a final strike.

Pin Identification

The student should learn to call the pins by number, as illustrated at left.



Marks

The more strikes and spares (called marks) obtained in a game, the higher the score will be. The following table shows how important marks are in obtaining a respectable score.

TO SCORE	Usual Number of MARKS REQUIRED
184 and over	10
174 to 183	9
164 to 173	8
154 to 163	7
144 to 153	6
134 to 143	5
124 to 133	4
114 to 123	3
104 to 113	2
91 to 103	1

1	2	3	4	5	6	7	8	9	10	

7B

Chapter 8
Intermediate and Advanced Skills of Bowling

Presented in this chapter is a progression of skills that are beyond the skill level of most beginning bowlers. The chapter contents, therefore, do not deal with the fundamental skills of bowling, except as a review.

Review of Basic Fundamentals

Use NCAA loop films, Athletic Institute loop films, AMF slides, Brunswick film strips, or R.J. Brady transparencies. (Any training aid that clearly illustrates the fundamentals of bowling without commercialism is appropriate.)

Stance on approach

Pushaway of ball

Pendulum swing (the thumb position between 9 and 12 o'clock throughout the swing and release)

4-step approach

Coordination

Timing of ball swing and approach

Release of ball. (Emphasize that the ball is released out on the lane, not at the forward foot or behind the foul line.)

Follow through after the ball release

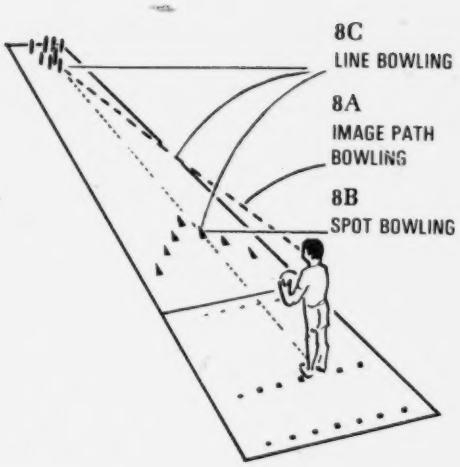
Review Sighting and Aiming Techniques

Regardless of the aiming technique used, the bowler must always finish his approach at the same spot just behind the foul line.

Know and be able to explain these techniques:

Pin aiming

Spot aiming



Concentrate on perfecting the aiming method that is the easiest and most accurate for the individual student.

Pin Bowling (Figure 8A)
In pin bowling the bowler looks at the pins and draws an imaginary line between the spot where he releases his ball to a point on the pin setup, usually the 1-3 pocket. The aiming line is the route over which the ball should travel.

Spot Bowling (Figure 8B)
In spot bowling the bowler draws an imaginary line in the same fashion as for pin bowling, but he picks a spot somewhere down the lane, usually at the arrows (range finders) where his ball will cross and then uses that spot for a target. During the delivery the bowler keeps his eyes on the range finder being used as his sighting mark and does not shift his glance to the pins.

Line Bowling (Figure 8C)
Line bowling is a combination of pin and spot bowling. The bowler picks a starting spot, a spot at the foul line, a spot out on the lane (usually the range finders), and then checks the 1-3 pocket. As he goes through his delivery, the bowler shifts his glance from the spot on the foul line to the lane spot and then to the pins. While line bowling is often utilized by advanced bowlers, some bowling instructors do not often teach it in school situations.

Development of Consistent Delivery

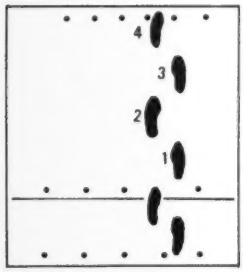
In order to develop proficiency in bowling a person should strive to do exactly the same thing in the same way with each first ball delivery. He must be consistent in everything he does; therefore, he first selects and memorizes an exact starting point on which he takes his stance. He then holds the ball, walks forward with precise timing of the swing, and releases the ball the same way with every delivery.

Personal Analyses to Develop Consistence
The points listed below must be observed and their consistent execution achieved before bowling proficiency will be developed. To insure the development of consistency the instructor should cover these

8D

8E

8F



8G

8H

points and ask the student to observe his own bowling style as well as the techniques of other students and suggest some corrections or adjustments.

Stance (Figure 8D)—should be the same all the time with the body in a comfortable position.

Feet—placed in the same position each time.

Ball—held comfortably.

Weight distribution—most of the weight should be on the foot opposite the bowling hand with the body in good alignment.

Pushaway. The pushaway is out and down with the arm fully extended and the wrist firm.

COMMON FAULTS: Pushing the ball forward and *upward* and dropping the ball straight down. Also walking forward with the ball before doing the pushaway.

The initiation of the pushaway and the first step (Figure 8E) normally takes place at the same time.

COMMON FAULTS: Pushing away before starting the approach or walking forward before starting the pushaway.

The pendulum swing (Figure 8F) should be made with the bowling arm straight at the elbow and wrist. The wrist should not be allowed to relax. The swing starts approximately waist high and ends at approximately eye level.

COMMON FAULTS: Carrying, forcing, or muscling the ball, bending the elbow and/or the wrist, and twisting or rotating the arm during the delivery.

The approach (or walk to the foul line) (Figure 8G). The comments below apply to the complete approach, not any one part of it.

The distance covered from the start to the finish should be the same each time.

The speed of the walk should not vary.

The walk should be in a straight line directly toward the target.

Backswing (Figures 8H). At the peak of the backswing the ball should be approximately waist high to shoulder high. (Check the position of the body at the completion of the third step.)

COMMON FAULTS: Too high a backswing, too low a backswing, and wrapping the ball around the body.

8I

Timing (Figure 8I) is the act of the bowler and the bowling ball arriving at the release point at the same time with the bowler in the proper finish position. If the timing is off, one or more of the aspects of the stance, pushaway, coordination, pendulum swing, backswing, and approach were not executed properly.

Release (Figure 8J). The ball should be released beyond the foul line with the thumb in a consistent position between 9 and 12 o'clock.

COMMON FAULTS: Lofting the ball, dropping the ball, and the thumb in improper position.

A follow through (Figure 8K) is executed after the release by concentrating on continuing the hand forcefully forward until it is approximately eye level.

COMMON FAULTS: Stopping the hand at the release point, jerking or pulling the hand from the grooved pattern, and attempting to push the ball forward instead of releasing the ball smoothly.

A student who can accurately perform the basic fundamentals outlined above 50 percent of the time is ready to be taught some of the advanced techniques of bowling which follow.

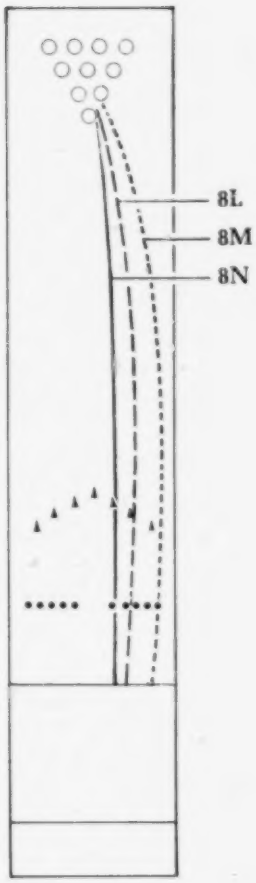
8J

8K

Bowling Lines

Strike Bowling Lines

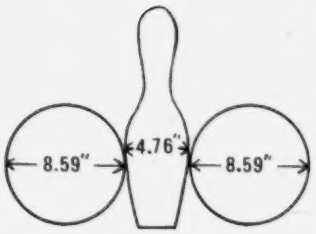
In order to achieve a high score in bowling, as many strikes as possible should be made. Because of a variety of factors such as lane conditions, type of ball rolled, physical characteristics of the bowler, etc., it is not always possible to roll from the same place on the approach or roll at the same spot on the lane. The different angles that are taken to score strikes and spares are called *lines*. Three different lines are explained and discussed in this section. The student should practice rolling all three lines and then select the line which is most comfortable and in which he has the most confidence. The other lines should be practiced frequently because a different sight picture is required for each line. Practice of the other lines will familiarize the student with the alternate lines that are used to convert various spare combinations or to cope with difficult lane conditions.



The explanation and discussion of the lines is oriented to the range finders; however, the student should be made aware that the lines may be rolled without utilizing the range finders, but a loss of accuracy may occur. The lines will vary from lane to lane due to differences in lane conditions, dust, humidity, finishes and wood textures. The instructions and directions that are given are presented for right-handed bowlers; consequently, they must be reversed for left-handed bowlers.

The common line (Figure 8L) is called "common" because it is the line most frequently taught in the beginning stages of instruction and the one used by most bowlers. In using the common line the student usually begins with his left foot placed near the center dot on the approach, walks in a straight line toward the target, and delivers the ball directly over the second range finder from the right-hand channel.

The outside line (Figure 8M) is the line that lies outside the common line (to the right toward the channel) and because the ball hooks less than usual, this line is used on lanes with dry conditions on the pin end or occasionally on very slick lanes. In using the outside line, the stance is taken to the outside or right channel side of the center dot, the student walks



8O

directly toward the target, and delivers the ball over or near the first range finder from the right channel.

The inside line (Figure 8N) is the line that is toward the center or inside of the lane from the common line. By adjusting the angle of approach and the board selected as the target, the inside line may be used for almost any lane condition. In using the inside line, the stance is taken inside (side opposite the bowling hand) the common line. The student walks toward the target and delivers the ball over or near the third range finder from the right channel.

Spare Bowling (Figure 8O)

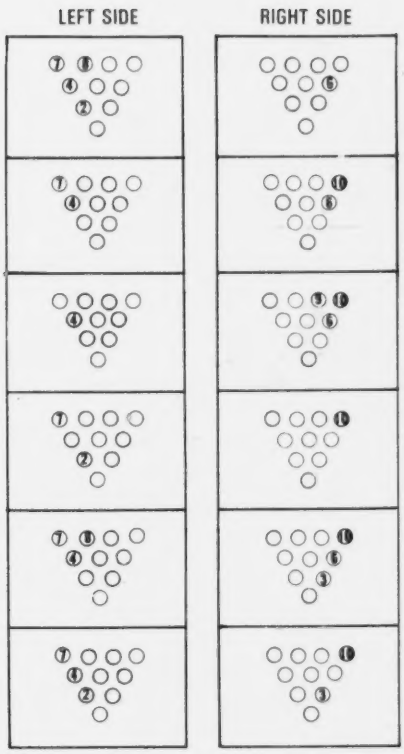
To achieve high bowling scores consistently it is imperative that the students become adept at converting spares. In this section is presented the theory of spare bowling, which theory was not covered in the fundamentals. The students should be reminded of the diameter of the bowling ball and pin since their widths play an important role in the conversion of spare leaves. A bowling ball is 8.59 inches in diameter and the pin, 4.76 inches. Since the pin will be knocked down if hit on either side, the hitting area is almost 22 inches wide. Thus it is surprising that so many single pin leaves (excluding 7 and 10 pins) are missed.

8P

Such spare combinations as the 4-5, 5-6, 7-8, 8-9, 9-10, are easier to convert than they appear to be. The pins are 12 inches apart from center to center. Half of each of them extends over 2.38 inches, covering a combined distance of 4.76 inches. Therefore, the distance between the widest (closest) parts of the two pins is 7.23 inches. Since the diameter of a ball is 8.59 inches, the distance between the two pins is 1.36 inches less than the width of the ball; thus, even with a small error both pins can be knocked down by the ball.

Near Pin Aiming Theory

There are many combinations of spare leaves, varying from a single pin to as many as ten pins. To convert these spares most authorities advocate the theory of aiming at the pin nearest the bowler. The utilization of this theory requires that several dif-



8Q

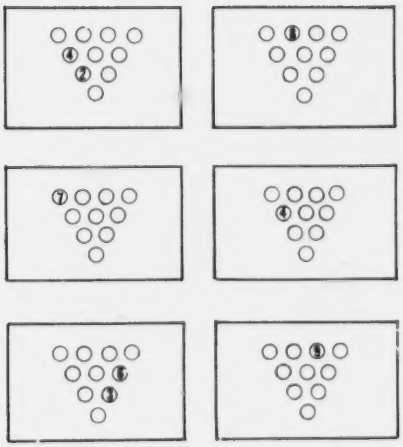
ferent positions on the approach must be used in order that a standard area on the lane may be selected for a target. This area is the second and the third range finders from the channel, which for right-handed students are the range finders on the right side of the lane.

In utilizing this (or any other) theory, the student should be taught that he should always directly face the target pin with his body, and that he should walk in a straight line towards this target while concentrating his vision on the area between the second and third range finders. In all spare bowling the key pin or target pin is the pin left standing that is nearest the foul line. For a 1-2 pin leave, for example, the 1 pin is the key pin as shown in Figure 8P. Five basic positions on the approach are utilized in following this theory.

The classifications of left-and right-side spares denotes the pins left standing from the viewpoint of the bowler who is facing the pins. Both classifications are divided into two categories, mid and far.

The center or strike area spares (Figure 8Q) are the 1-2, 1-3, 5-8, 9, or any combination of these pins. The stance is taken with the left foot in the area of the center dot for the key pin and the ball is aimed between the second and third range finders.

The mid-left spares (Figure 8R) are the 2, 4, and 8 and most variations involving them. In converting these spares, the student takes a position two to seven boards to the right of the center dot and faces the key pin. This position is normally three to five boards to the right of the center dot on the approach. The exact position taken depends on the type of ball delivered, the physical characteristics of the bowler and the lanes, and other individual factors.



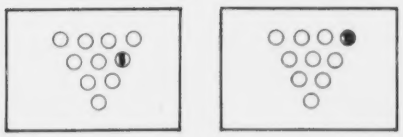
8R

8S

8T

The far-left spare (Figures 8 S). Pins are the 4 and 7 pins. The stance is assumed eight to ten boards to the right of the center dot.

The mid-right spares (Figure 8 T) are the 3, 6 and 9 pins. The stance is taken five to ten boards to the left of the center dot.-

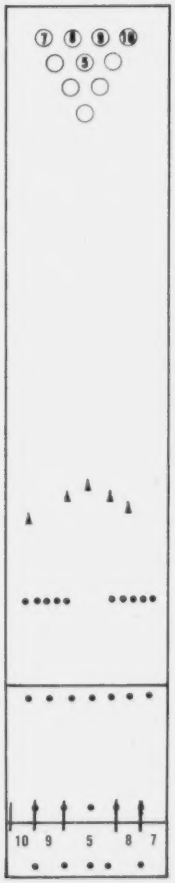


8U

The far-right spares (Figures 8 U) are the 6 and 10 pins. The stance is ten to fifteen boards to the left of the center dot.

Back Row Pin Aiming Theory (Figure 8 V)

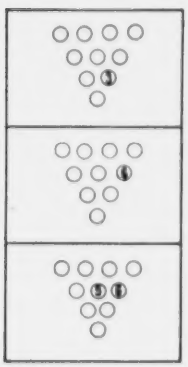
A second method for determining the stance position when converting spares also makes use of the key pin theory as a base, but only the pins in the back row plus the 5 pin are utilized as the key pins. Thus, the 5, 7, 8, 9, and 10 are the key pins. The goal is for the student to learn what positions he must use on the approach to hit these pins individually, since all spare leaves involve a combination of these pins only, whether they are standing or not. By hitting these pins, the bowler will automatically carry the pins in front of them. When this theory is utilized, the student must aim to hit the key pin with the ball, or pass over the spot where the key pin would be. This aiming point will cause the ball to pass over the key front pins.



8V

The starting positions for hitting these key pins are basically the same as used in the near pin theory; that is, move toward the right side of the approach for left-side pins and toward the left for right-side pins. The aiming areas are quite similar, and the stance and approach procedures are identical. For the hook-ball delivery, which most bowlers use, the five starting positions are depicted in Figure 8V.

The back pin method of the key pin theory requires the student to have some imagination, since many times the key pin for a spare leave has been knocked down, and the student must know what pin would be behind the pins left standing before he can take the proper stance location to convert the spare. This method has been demonstrated to work well for students who can visualize the position of the five rear pins when they are not standing. Examples of spare leaves requiring imagination are shown in Figure 8W. If the spare leaves give the student a choice of two key pins at which to aim, he should aim at the one that is easiest for him to hit.



8W

TEACHING AID: Charts showing the location of the pins. A string or line 80 feet long that can be stretched from the back of the approach to the pins. This will show the student that the lines taught are true lines and thus is especially effective when teaching the line to roll for the [illegible] and 10 pins.

Advanced Techniques of Bowling

In this section, only the mechanics of rolling the hook ball will be presented.

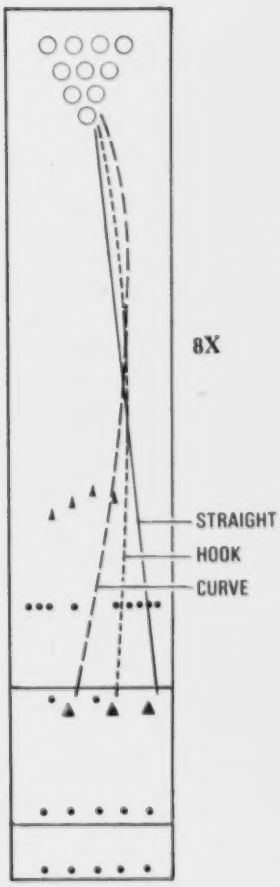
Types of Ball (Figure 8X)

A straight ball travels in a straight line to the target.

A curve ball travels in a continuous arc down the lane.

A hook ball travels almost straight down the lane and parallel to the channels for 2/3 to 3/4 of the distance to the pins where it then makes a sharp turn into the pins.

A back-up ball travels down the lane and then makes a hooking action toward the side of the body from which it was delivered. This type of ball usually results from a mistaken application of basic bowling techniques.



Actions of Hook Ball

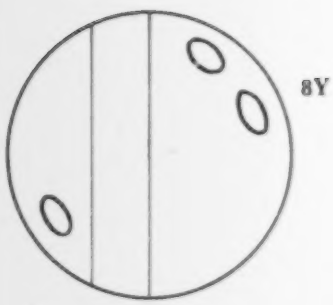
Each hook ball rolled does three things on its way to the pins: *skids, rolls,* and then *takes whatever curving* (hooking) action was placed on it during the release. The amount of skid and take is in part determined by the speed of the ball. Normally, the delivered ball will first skid for 15 feet, roll for 25 feet, and take for 20 feet. Balls rolled too fast will skid for a greater distance, leaving less room for take since the length of the roll varies little with changing speeds. On the other hand, if a ball is rolled too slowly, it will not skid far enough, leaving too much distance for take; thus, a ball rolled too slowly will hook and then fade.

The hook ball involves a natural position of the hand and is therefore the easiest ball to roll. It reaches the pocket at the most advantageous angle, and its rotation holds ball deflection to a minimum.

Hand Positions and Action for Delivery

While the bowler should strive to keep the *hand and thumb position* constant throughout the delivery, and release, the position of the thumb hole at the time of release is the most important consideration. It is recommended that the ball be held with the thumb positioned at approximately 10 o'clock, and the ring finger positioned at approximately 5 o'clock (see illustration of bowling clock).

At the time of the release the hand and wrist should



8Y

be straight and the hand positioned slightly behind ball.

Hand action for hook

The thumb slides out first.

The hand and arm are lifted straight through – they should not be rotated.

The fingers provide a counterclockwise rotation or lift to the ball by exerting pressure in an attempt to close the hand into a loose fist.

Ball tracks:

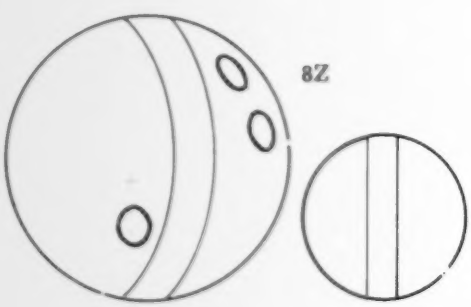
Full roller – the ball rolls on its full circumference. The track is between the thumb and finger holes.

Semi-roller – the ball rolls on approximately 3/4 of its circumference. The track will be just outside the thumb hole.

Semi-spinner – the ball rolls on approximately 1/3 of its circumference. The track will be 2 to 3 inches below the thumb hole.

Spinner – the ball rolls or spins on a small circle on the bottom of the ball.

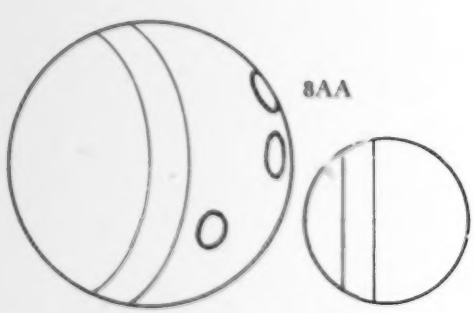
TEACHING AID: (Figure 8Y) A roll of white tape placed around the ball, dividing it into two equal halves, will permit the bowler to check quickly the action of the bowling ball as it rolls down the lane. The students should observe this action by keeping their eyes focused on the tape as illustrated in Figure 8Y.



8Z

Delivering the ball.

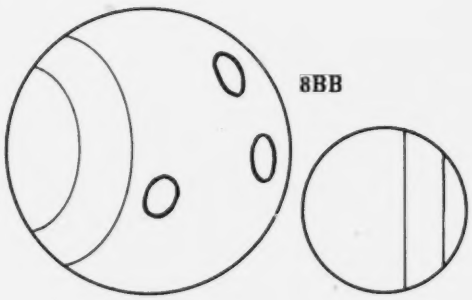
Full roller (Figure 8Z) – The full roller is an effective ball as it will hold a line much better than the other deliveries and the deflection in either direction is held to a minimum. The full roller is especially effective for crossover hits and slick lanes. It is delivered with the thumb hole at approximately 10 o'clock. The thumb is moving clockwise at the time of release from the ball while the fingers are moving counterclockwise. A full roller is achieved when the thumb is allowed to rotate counterclockwise or toward the body during the backswing and is then rotated clockwise during the forward portion of the swing. For many students this delivery is easier and more comfortable than forcing the thumb to stay in one position throughout the swing. The tape pattern



8AA

for the full roller should appear to stand straight up and down during the trip down the lane.

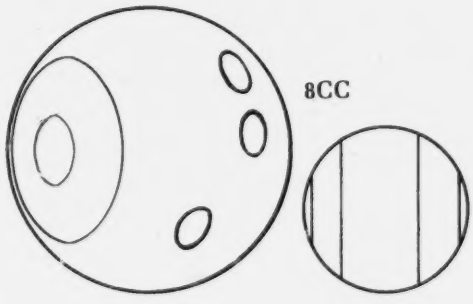
Semi-roller (Figure 8AA) – this type of ball track is the most common, as the hand position is the one taught at the beginning level. Furthermore, no turning of any portion of the hand or arm is necessary on either the backswing or the forward swing. This type of ball gives maximum pin action with minimum deflection. To deliver the semi-roller, the thumb is positioned at approximately 10 o'clock in the stance and held in this position throughout the swing. At the release, the thumb slides from the ball first and the fingers move counterclockwise to supply ball rotation. The tape pattern for the semi-roller: tape should appear on the right-hand side of the ball during the trip down the lane. The "arc" made by the tape gets "smaller" as the hook takes.



8BB

Semi-spinner (Figure 8BB) – The thumb hole is at approximately 10 o'clock at the time of release. The ball is delivered with a twisting and/or turning of hand and arm. The thumb and fingers are moving counterclockwise at the time of release. The tape pattern for the semi-spinner should appear on the right side of the ball.

Spinner (Figure 8CC) – the ball rotates like a top. The thumb release is usually between 8 and 9 o'clock. The thumb and fingers are both moving counter-clockwise. The ball is delivered with an exaggerated twist of the hand and arm. The hand will be on top of the ball at the time of release. The tape pattern for the spinner should show very little tape, but what is visible appears on the bottom of the ball.



8CC

Chapter 9
Evaluation and Testing

The main purposes of any testing or evaluation are (1) to determine what progress the pupils are making in assimulating the skills and knowledges presented in the class and given in outside assignments, (2) to identify areas that are causing the students difficulty in learning in order that additional effort can be devoted to those problem areas, (3) to identify those students who have not mastered certain concepts or who have an incorrect image of how to perform certain skills in order that they can be given individual help by the teacher or a more advanced student, and (4) to identify the class level of learning and skill at the completion of the unit in order to make individual and group evaluations and comparisons to others of similar grades and age levels. Another important reason for testing and evaluating is to obtain a measure of the effectiveness and efficiency of the class organization, teaching methods, instructional aids, and the individual teachers that are utilized in teaching the bowling unit. The combination of these, in turn, will yield an overall evaluation of the entire unit. The teacher should realize that most test authorities recommend that *no more than 10 percent* of the class time should be devoted to formal testing and evaluation. This does not mean, however, that informal evaluation should not be done at all times. The alert teacher should continually note the progress made by each student, and whenever possible, give individual instruction as it is needed.

The methods used to evaluate a student's progress in bowling are many and they vary in their approach and content. Since no single method or technique will yield a complete evaluation, a combination of several evaluative methods that are specifically geared to the bowling unit should be employed. Some of the techniques and methods commonly used in the informal and the formal aspects of testing a program in bowling are:

First ball scores—to note improvement and overall bowling ability level (this is believed to give a truer indication of ability than bowling averages that are based on only a few games).

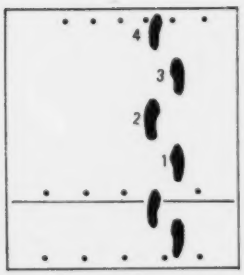
Bowling averages -for the above purposes plus the determination of bowling handicaps.

Written tests—almost all facets of bowling knowledge, strategy, and theory (and even bowling skills and ability) can be evaluated.

Skill tests—to evaluate selected bowling skills (such as the ability to pick up selected spare leaves).

Ability to score—tested by means of written tests and the scoring of hypothetical and actual games.

A written test is an excellent means of evaluating students during or after they have completed a bowling unit. Written tests are especially valuable in testing for a knowledge of rules, etiquette, scoring, equipment used, and techniques used to roll for a strike and various spares. A sample written test appears at the end of this chapter.



Formal and informal skills tests of varying lengths and combinations are an important evaluative device in which the individual student demonstrates his mastery of the skills and techniques of bowling.

Components for a Bowling Skills Test Battery

Have the student accurately demonstrate in good form:

How to find the point of origin.

Obtaining the stance (position of feet, weight distribution, alignment, position of ball).

Coordinated body movement.

The correct position on approach for rolling a strike.

How to roll a ball over the correct lane marks to obtain a strike.

The correct position on the approach for converting a ten-pin spare.

How to roll a ball over the correct lane marks to convert a seven-pin spare.

The approach—corrective measures. Have a student select, by lot, a common error and describe the correction.

Beyond the foul line—corrective measures. Describe and illustrate the correct hand position to:

Roll a hook ball.
Roll a straight ball.

Demonstrate a hook-ball delivery by rolling a ball on the lane.

Roll a two-game block—competency test.
Tally your own score.
Calculate your average.
Calculate your handicap
(based upon_____% of_____scratch).

Sample Beginning Bowling Skill Test

NAME _____

Starting Position (2 points each...18 points maximum)

_____Distance
_____Feet position
_____Weight distribution
_____Knees
_____Height of ball
_____Ball Alignment
_____Elbow
_____Wrist
_____Thumb position

Coordinated Body Movement (2 points each...18 points maximum)

_____Footwork
_____Tempo
_____Armswing
_____Shoulder - hip
_____Pushaway
_____Backswing
_____Balance
_____Release
_____Follow through

Point of Origin (2 points each—12 points maximum)

_____Demonstrate: Distance from foul line_____ft.
_____Describe: Measures taken to correct lateral alignment for ball which consistently goes too far to the right in attempting a strike.

_____Feet: Straight to intended line yes/ / no/ /
_____Toes together / / Left foot ahead / /
_____Close / / Fairly close / / Apart / /
_____Right foot ahead / /

Stance (2 points each—16 points maximum)
_____Weight Distribution:
Mostly right / / Mostly left / /
Evenly distributed / /
_____Knees: Both bent / / Right bent / /
Left bent / / Straight / /
_____Relative Height of Ball:
Chest high / / Waist high / / Knee high / /
_____Alignment of Ball:
Right of shoulder / / In line with shoulder / /
Between shoulder and center line / /
Center line / /
_____Weight of Ball:
Right hand / / Left hand / / Evenly distributed / /
_____Elbow: Tucked into hip / / Away from hip / /
_____Wrist: Straight / / Fairly straight / / Bent / /
_____Thumb: Relative position on clock _____

Coordinated Body Movement (18 points) (2 points each—18 points maximum)
Footwork:
_____Number of steps:_____
Length of steps : Long / / Short / / Moderate / /
Tempo:

_____Length of steps: Long / /Short / /Moderate / /
Tempo:
_____Irregular / / Fast / /Slow / / Moderate / /
_____Drifts / / Heel-Toe / / Shuffle / / Straight Line
_____Armswing: Parallel / / Outside-in / /
Inside-out / /Loop / / Bent elbow / /
Shoulder and Hips Position:
_____Shoulders: Right angle to intended line / /
Facing left of intended line / /
Facing right of intended line / /

_____Hips: Right angle to intended line / /
Facing left of intended line / /
Facing left of intended line / /

Push-Away:
_____Long / / High / /Low / /Horizontal / /
_____Late / / Early / / O.K. / /

Backswing:
_____Below waist / / Waist high / /
Shoulder level / / Above shoulder level / /

Sample Written Bowling Test

Section I: Multiple Choice Questions (2 points each—20 points maximum)

Directions: On the special answer sheet encircle the letter of the correct answer to each question.

Which of the following is called a BABY SPLIT?
1-7
5-7
4-6
3-10

What does a back-up ball do (right-handed bowler)?
Curves to the right
Curves to the left
Goes straight down the lane
Referred to as a gutter ball

The tracers or arrows on the lane are used for what purpose?
Spot bowling
Decoration
Cover up bad spots on lane
Timing

What is a dead ball?
A ball made of rubber
A curve ball
An ineffective ball
A ball out of round

How is a foul scored?
Counts zero for that ball
Deducts 10 points from score
Counts 10 plus what you get on next ball
No penalty, bowl again

What pin is the head pin?
#1
#3
#5
#10

What is the king pin?
#1
#3
#5
#7

What does it mean to loft a ball?
Ball rolls too fast
Use too light a ball
Release the ball too late and too fast over the foul line
Roll a dead ball

Which of the following are bonus marks?
Zeros for splits
F for Fouls
X's and /'s for strikes and spares
–'s for misses

What is the lightest sanctioned bowling ball?
16 lbs.
14 lbs
8 lbs.
No limit

Section II: True - False Questions (2 points each – 50 points maximum)

Directions: On the special answer sheet for each statement that is true, encircle the T; for each statement that is false, encircle the F.

T (1) Bowling can be traced to ancient Egyptian times.

T (2) Kegling is a form of bowling.

F (3) Bowling balls may be of any weight as long as they are round and meet other ABC specifications.

T (4) Plastic-coated pins weigh from 3 lbs. 2 ozs., to 3 lbs. 10 ozs.

T (5) Bowling lanes are 60 feet long from foul line to head pin.

F (6) The spots on the pin decks are 12 feet apart.

T (7) Hips and shoulders at right angles to the target at all times.

T (8) The ball and arm usually swing like a pendulum of a clock.

F (9) The harder you throw the ball, the higher your score will be.

T (10) The left toe of a right-handed bowler points to the target when the slide is completed.

F (11) Follow through with your thumb pointing up.

F (12) The left knee should be straight and not bent when the ball is delivered.

T (13) There is over eleven (11) inches of area to hit when bowling at a single pin.

T (14) A strike counts 10 plus what pins you get on your next two balls.

T (15) There are over 35 million people participating in the game of bowling today.

F (16) Bowling balls are made of rubber and have liquid centers.

T (17) The left hand helps support the weight of the ball at the stance.

T (18) Bowling balls are picked up with both hands on the sides of the ball.

T (19) In the back swing, the ball normally does not reach higher than shoulder level.

T (20) A foul means that some part of your body has touched on or beyond the foul line.

F (21) You may not lean over the foul line even though your feet have not crossed the line.

T (22) The arrows and dots on the lanes are used for spot bowling.

F (23) A spare automatically counts 20.

F (24) Ten (10) consecutive strikes constitute a perfect game.

T (25) Bowling pins may be made of wood with plastic coating.

Section III: Scoring Problem (2 points each—20 points maximum)

Directions: Enter the score for each frame on the answer sheet.

Frame

The bowler starts off with a spare, 8 pins on the first ball and 2 pins on the second ball.

His first ball carried 6 pins and his second ball carried 3 pins.

He is right in the pocket for a strike.

Another strike!

He took out 9 pins on his first roll, but he could not get the last one.

He is back with another spare, 7-3 this time.

On the first roll he downed 5 pins, on the second roll, 4 pins.

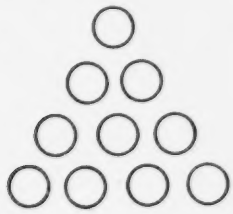
8 pins fell on the first ball, but after the second ball, there was still one pin standing.

On the first roll 4 pins, on the second roll, 5 pins.

But he has not given up. He comes back with a strike that gives him two extra balls. He makes first ball count with another strike. On the second ball he carried 7 pins.

Section IV: Pin Identification (2 points each—10 points maximum)

Put the proper number
of the pin in the plain
circles. Do not write in shaded circles.



1	2	3	4	5	6	7	8	9	10	

Chapter 10 Administrative Concerns

Off-School Premises Bowling

At the conclusion of a unit of basic bowling instruction in a gymnasium, it is desirable that students have actual experience with regular bowling equipment at a bowling center. If the school includes the use of a bowling center for an instructional program, intramurals, interscholastic activity, or a field trip, explicit policies and procedures should be immediately formulated. Administrative policies should be carefully established with a clear understanding on the part of school authorities and bowling center management. Bowling centers are private establishments and as such vary in their ability to provide lanes at reduced costs, shoes, instructional aids, and other forms of assistance. Most bowling center proprietors are willing to cooperate with school authorities in order to enhance the instructional program. Obviously, questions will arise such as: Which center to utilize? Which center is located most conveniently? Which center follows appropriate standards related to students on the premises? If needed, who arranges and pays for transportation to the center? Is liability insurance needed?

In most metropolitan areas executive secretaries are employed by the bowling centers; this person can be of invaluable assistance to the school administrator who plans to add bowling to the physical education, intramural and/or athletic program.

Some suggested agreements to be reached once the center has been selected are as follows:

The time most suitable for the program.

The desired atmosphere of the center (it should be considered as a bowling gymnasium to be used as a physical education facility under the supervision of the physical education department).

Regulations regarding food, soft drinks, etc.

Responsibility for observing rules, regulations, conduct, and care of equipment.

Transportation—who will provide it? What is the cost?

Insurance for transportation and bowling center activity. If transportation is provided by private sources, their insurance should meet the school, state, and local standards. When possible, transportation should be provided by the school to eliminate many obvious problems. The insurance policy should be the same one as provided by the schools for all activities.

The cost of instruction varies in most cases and depends on a number of items: length of class or course (one or several periods); some centers charge per student per class, others may lease the facility for x number of hours per day or week. Where the students pay, the fee should be collected early as for any other laboratory fee such as science, typing, driver education, gym, etc. This method guarantees payment and avoids possible embarrassment to the student or the school. Most centers work with teachers to assure everyone the opportunity to learn bowling skills, regardless of their inability to pay the fees.

When intramural and interscholastic programs are developed, awards should be consistent with other intramural and interscholastic activities. Additional information may be obtained from the State Athletic Association, Interscholastic League, or the National Federation of State High School Athletic Associations.

Examples of School Bowling Programs

In the following sections are reproduced two actual school bowling programs, together with some information pertaining to their development and conduct. They should contain considerable information of value to the reader who is interested in developing such a program for his school system.

Pilot Project of Interscholastic Bowling Columbia, South Carolina

Bowling, as an activity in physical education, intramurals and interscholastic competition, has increased during the past few years. Only a few lanes were in operation in South Carolina in the late 1950's and several of these establishments operated duck-pin bowling more than ten-pin play. At the time this manual was written there were over 35 houses and

448 beds, and the lanes were predominately ten-pin. Columbia has three bowling centers with eighty lanes serving the public. The Columbia Bowling Council and the Columbia Bowling Association realized that little opportunity was given to youth bowling; consequently, youth programs were initiated. The two organizations were interested in developing interscholastic competition as a means of motivating youth into an activity that provides carry-over values for leisure time in later life. A committee was appointed for the purpose of organizing a pilot program of interscholastic bowling in the secondary schools of the greater Columbia area.

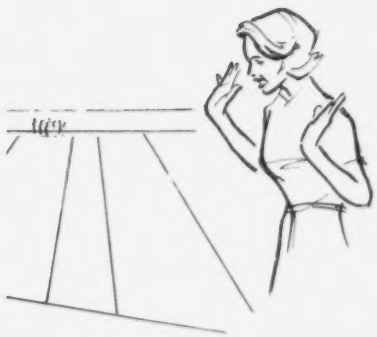
The first step for the committee was to arrange a meeting with the executive secretary of the South Carolina High School League. He was enthusiastic about the proposed plans because the competition included both boys and girls. He encouraged the committee to arrange a meeting with the district superitendents in the Columbia area.

The second step was to meet with the administrators and present the program of bowling as outlined by the Executive Secretary. Two of the superintendents agreed to support the pilot program.

The third step involved a meeting with the secondary school principals in the office of the superintendent for the purpose of explaining the program. The final procedure was to secure the use of the bowling establishments and the committee met with the three bowling proprietors. The proprietors agreed to provide two practice sessions in the afternoon from 4 to 6 pm on Monday and Wednesday and game competition on Tuesday and Thursday from 4 to 6 pm. For practice sessions the schools were assigned to the bowling establihsment near their campus and a league schedule was drawn up. A meeting was held in the High School League Office for all principals and coaches for the purpose of presenting the program of practice (no team would be permitted to practice without the presence of the coach) and competitive schedules. Eligibility rules were discussed as well as the school's responsibility in the conduct of the program as stated in the handbook of the South Carolina High School League. The coach of University High School was elected as the director of the program. Practice sessions got under way September 14, 1964, four weeks

prior to the first schedule match, Tuesday, October 13, 1964. There were eight schools participating. The schedules for the matches rotated on an alternate basis with the three bowling establishments. The girls bowled in lanes 1-8 and the boys in lanes 9-16. On the night of the last match a banquet was held and the Columbia Bowling Association purchased trophies for the winning boys and girls team. The results of the pilot program were encouraging and additional projects were proposed for six or eight centers in the state dur ng the 1965-66 school year. The possibility of getting the AAA Conference to initiate a pilot program was suggested, which would involve 22 of the largest schools in the state.

The following observations, recommendations, and conclusions should assist the organization of future programs in the area of bowling.



Observations

Participants displayed the same competitive spirit as did participants in other athletic contests.

Superintendents, principals, and athletes of the schools competing expressed an interest in continuing the program.

The coaches of the teams were enthusiastic in guiding their teams during the matches.

Attendance by parents, lay groups, and school personnel was encouraging.

No forfeitures or postponements were evident.

The program would not have been successful without the cooperation of the bowling proprietors.

Some coaches had very little knowledge of bowling.

The director kept records up-to-date and conducted a successful program.

The high average for boys ranged from 173 to 149.

The high average for girls ranged from 156 to 108.

Six boys had a high game of over 200.

Six girls had a high game of over 190.

Recommendations

Bowling coaches should participate in a clinic prior to the season.

Publicity should be given on the sports page as it is for other interscholastic high school events.

More pilot programs should be initiated in order to increase the support for interscholastic bowling.

That the South Carolina High School League continue to support interscholastic bowling.

That the South Carolina Bowling Proprietors go on record as supporting interscholastic bowling in their area on the same basis as the program in Columbia.

Intramural Bowling Program: Fairfax County, Virginia, Intermediate and Senior High Schools

Introduction

This intramural program is designed as a follow-up of the Gym Bowl Instructions for the purpose of offering the student the opportunity to learn and participate in the development of a lifetime sports skill that will begin in his or her physical education class and be continued through the life span.

The program is simple in design, but has students of various schools participating in a school activity that takes place away from the school, yet maintains satisfactory standards, organization, participation, and supervision. This program has been incorporated into the intramural programs of the schools and is an aid to the physical educator as he attempts to meet and stimulate the needs of the individual student.

Conclusions

The pilot program was effective.

Students, coaches, and administrators suggested that the program continue in order that bowling may become an additional sport in the South Carolina High School League.

Written by Harold J. Schreiner,
Supervisor of Physical Education
State Department of Education
Columbia, South Carolina 29201

Advance Preparation

Meeting with Bowling Proprietor
Day and Time
Transportation
Supervision
Length of league season

Cost
Instructional Program on lanes
League awards
All-America Youth Championship eligibility

All items should be discussed and thoroughly planned prior to a call of students for the organizational meeting. If the school administrator or teacher-sponsor so desires, the above items may be discussed with the bowling proprietor, and he will come to the school and organize the league and answer questions from the students.

Call of the Organizational Meeting (Announcement to All Interested Students.)

Announcing day, time, and date to begin
Transportation
Length of season
Cost
Instructional program
Awards
All-American youth championships eligibility
Parental permission slip

Sessions at the Bowling Center

First Session
Nomenclature of bowling equipment
Approach-Foul line
Lane-Pinspotter operation
Communication with control counter for service
Lesson one of Learn to Bowl
Ready position
Pendulum swing
See the operation of pinspotters

Second Session
Lesson Two of Learn to Bowl
Review ready position
Review pendulum swing
Pushaway
Four-step walk

Third session
Lesson Three of Learn to Bowl
Review ready position (very brief)
Review pendulum swing (very brief)
Review pushaway

Review four-step walk
The complete delivery
Pin identification

Fourth session

Lesson Four of Learn to Bowl
Review pushaway
Review four-step walk
Review and practice complete delivery
Review pin identification
Terminology
Scoring

Fifth session

Students report to assigned lanes and bowl for averages
Organization of teams
First session the student will pay for games

Sixth session

Begin league play

Close of League Season

Presentation of awards (if school has all sports and intramural awards assembly, presentation to be made at this time).
Qualifying for All-America Youth Championships
Bowling Center Champions
State Championships
National Championships (graduating seniors only, including educational tours, scholarship testing, bowling competition).
Awards—$21,000 in scholarships in three divisions; boys and girls eligible.
Scholarships awarded on 100-point formula as follows:
General interest college entrance type test - 50 points
High school transcript of grades and class rank - 10 points
Essay - Why entrant desires a scholarship - 10 points
Bowling performance in finals - 30 points
This instruction program will be conducted in order to teach proper bowling skills to those students desiring to bowl, but who did not participate in the gym bowl program conducted in the physical education classes.

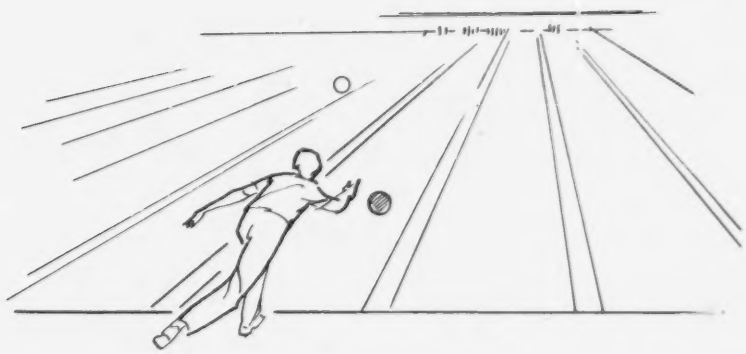
All instructions will be provided at the lanes by certified bowling instructors and the physical education teachers or sponsors will be invited to assist if they so desire.

The prevailing youth bowling rates will be uniform at all participating centers.

Transportation will be worked out with the bowling proprietor and the school sponsor or teacher in charge of the program. It is recommended that activities buses or school buses be used if available. Otherwise, the proprietor and the school should secure commercial or other available means of transportation to their homes.

All participating centers will assist by having a youth director or other responsible personnel available to assist in supervision of league play.

All participating centers will be sent copies of this program and will have a list of the schools in the area in which they will serve.



Chapter 11
Bowling Opportunities

Introduction

Bowling is truly a lifetime sport. Numerous opportunities abound for students to employ for many years, in a wide variety of extracurricular bowling activities, the skills developed in bowling classes. The students should be appraised of these opportunities and if at all possible, provisions should be made to accommodate the interest in and enthusiasm for bowling that has been engendered in the instructional program. Many successful programs of this nature have been developed in junior and senior high schools, colleges, and universities throughout the nation.

Immediate Opportunities

Intramural Bowling

Bowling is a favorite activity of many students who participate in the school intramural sports program. Bowling competition in the gymnasium in which Gym Bowl equipment is utilized or in a bowling center where house equipment is provided can be scheduled for individual or team competition; for example, on a coeducational basis or for either sex. Some of the possibilities for intramural bowling are teams of 3, 4, or 5 bowlers, doubles matches, open leagues (in which anyone can bowl), classified leagues (according to bowling ability or average), handicapped leagues (in which teams with a lower average are "spotted" extra points), and special events such as student-faculty matches. Opportunities also exist for the interested bowling student to participate in open or league competition entirely outside of the school setting.

A guideline that was developed for organizing and conducting a high school intramural bowling program appears below. This is one of several possible ways by which an intramural bowling program might be developed; individual adaptations must be made according to each school situation and the considerations that are of most importance.

Ideas and Techniques That Can Be Used in Developing a School Intramural Bowling Program

School Approval
Interest of students from instructional program
Need of student in developing new lifetime sports skills
Improving intramural program
Contact for a bowling center
By using the correct contact, time and effort will be saved.
The center recommended will be interested in helping your school program.
Bowling center. The complete program should be discussed and planned to the smallest detail, including the following items:

Time and dates
Cost
Transportation
Supervision
Bowling materials
Awards
Equipment - shoes and balls
Team organization
Instruction
League organization
School requirements
Liability
School approval of program. A complete outline of the bowling program should be submitted. The outline should include:
The agreement of the bowling center to assist in the program. This would include cost, time, transportation, materials, equipment, dates, center operations, and any other items agreed upon by the center and the school. (See Chapter X for additional information.)
Organization of league.
Operation of league.
Liability.
League organization should include such things as:
Information to students.
Meetings: general, bowling establishments, team captains

Cost: Fee payment - handling money
Team selection: method - size
League secretary: Notebook - duties
Rules and Regulations
Awards
Schedule: Time - dates
Publicity: School paper - pictures - local paper

League operation should include items such as:

Transportation
Dress
Conduct at center
Absent students
Shoes and balls
Instruction - individual
Forms

Evaluation of program. In evaluating the bowling program, the following aspects should be considered:

Problems
Interest
Improvement

Interschool Bowling

Possibilities exist for the gifted student to compete or to be involved in interschool bowling competition of various types when such competition conforms to the rules established by the various athletic associations concerned. Some quite successful programs of this nature have been developed in the United States.

College Bowling

At the college level intramural bowling, student leagues and competition between various institutions all offer opportunities for continued bowling participation. Nationwide college bowling tournaments are held yearly.

Lifetime Opportunities

The opportunity to continue bowling as a lifetime sport is open to almost everyone, since bowling centers are located throughout the country. Air-conditioned centers in which weather and climate are no problem afford unlimited opportunities for bowlers of all ages to participate in this highly popular activity. In addition to open bowling, which is usually

available at almost anytime, bowling programs and leagues have been established for juniors, women, daytime bowlers, nighttime bowlers, employees of certain companies and industries, and many other social groups. Special provisions and concessions, together with the arrangement of selected time periods, have been made for senior citizens, the physically handicapped, and the blind, for example. Various tournaments for bowlers are held regularly at the local, regional, and national level. For the highly skilled bowler with the interest and aspiration, the opportunity for joining the ranks of the professional bowlers is a possibility.

Organization and Preparation for Competition

All students need a general knowledge of league organization, team organization, and team schedules which will be useful for intramural programs, interscholastic activities, or league bowling outside of school. There may be a desire to organize an intramural tournament with teams made up of class members, Science Club, GAA, or other school organizations to bowl at noon or after school. These usually are handicap tournaments where, in order to equalize the competition, bowlers are given a handicap based on two-thirds of the difference between the bowler's present average and 190 (the more common practice for junior bowlers). For example, a bowler with an average of 145 would have a handicap of 30 (190 minus 145 is 45; two-thirds of 45 is 30). This handicap will probably change from week to week as new scores are included in the running average. The team's handicap is simply the total of the individual handicaps. Many types of leagues are in operation at local bowling centers. Leagues are organized at the request of church groups, commercial businesses, and other occupational groups. Organized league bowling is ordinarily sanctioned by the YBA or AJBC for boys and girls, ABC for men, and the WIBC for women.

Suggested Outline of the Materials Which Need to be Covered

I. General Information
   A. Average
      1. Individual
      2. Team
   B. Handicap
      1. Individual
      2. Team
   C. Rotating from one lane to the adjoining lane during a game or series of games
   D. Playing schedule
      1. Regular weekly bowling is usually round robin
      2. Tournament competition is usually the highest handicap series for the team based on a series of three games
   E. Team lane assignments
      1. Teams will bowl on different lanes each week until each team has bowled on all lanes
   F. Statistics
      1. Weekly highs
      2. Season highs
      3. Tournament highs
      (The league secretary keeps the following information on all categories listed above)
         a. Individual high single game
         b. Team high single game
         c. Individual high three games series
         d. Team high three games series
      4. Keep a running total of each team's won and lost record

II. Divide group into teams (equal number of teams with three to five members on each team).
   A. Select a captain for each team whose duties are
      1. Keeping score while team is bowling
      2. Total team's score after each game
      3. Total individual's three games series as well as team's
   B. Select a name for each team
   C. Explain team line-up
      1. "Lead-Off"—is the first bowler, usually the second best bowler on the team.

2. "Anchor-man"—is the last bowler, usually the best bowler on the team.
3. The weakest bowlers are usually placed near the middle of the line-up.

III. Select a day, time of day, etc., for group to meet.

IV. Elect a secretary for the group whose duties are
- A. Posting playing schedule for teams
- B. Figuring individual's average and handicap
- C. Figuring team's average and handicap
- D. Posting individual's average, handicap, etc., in advance of next bowling date.
- E. Keeping teams won and lost record
- F. Keeping statistics on weekly and season highs

Chapter 12
Success Stories

There are many success stories related to the sport of bowling throughout elementary, secondary, college, and university levels. Only a few of the programs brought to the attention of the Lifetime Sports Education Project through publications, conventions, workshops, and other sources are referred here.

Elementary programs are springing up throughout the country as a direct result of the Lifetime Sports Education Project Clinics, and the elementary school teachers are using improvised materials discussed in detail in Chapter II: Bowling for Elementary Students and Special Students. These skills are being taught in the regular school setting and the application of these skills are being practiced in bowling centers throughout the local communities. Two such programs are in operation in the Norfolk Public Schools, Norfolk, Virginia, and the Rockville Public Schools System, Rockville, Connecticut. Information may be obtained by directing your inquiry to the Director of Physical Education of these two school systems.

Bowling programs at the secondary school level have been growing at a rapid pace. Much of this growth can be attributed to new equipment devised for teaching the basic fundamentals of bowling in gymnasiums, hallways, cafeterias, outside hard sugface areas, lawns, and other areas. In the majority of these schools, the programs are offered first in the physical education curriculum utilizing typical facilities on the school site, and in many cases the youngsters are then transported to local bowling centers for a laboratory situation. Some schools, after the laboratory session, arrange transportation to and from the bowling center for regular competition within the physical education class. In some schools, students are transported directly to the bowling centers for on-the-lane instruction, followed by competitive bowling during the remainder of the time assigned to bowling as a physical education

activity. Schools having information regarding this type of program are:

Roosevelt Senior High School
4029 - 28th Avenue, South
Minneapolis, Minnesota 55406

Northeast Independent School District of San Antonio
1503 Bitters Road
San Antonio, Texas 78213

The Elementary and Secondary Education Act of 1965 has provided financial assistance to several local boards of education. Programs developed as a result of this legislation and giving some attention to bowling are located in the El Paso Independent School District, El Paso, Texas, and in the community of Ellensburg, Washington. In these two programs, instruction is conducted both in the gymnasium and at the local bowling centers. Funds are made available to assist the school district in implementing these programs.

As a result of basic instruction, successful intramural programs are being developed in many communities. Two such intramural programs are being carried out in the Fairfax County Public Schools, 10700 Page Avenue, Fairfax, Virginia, and in the Dade County Public Schools, Lindsey Hopkins Building, 1410 Northeast Second Avenue, Miami, Florida 33132.

Bowling in some areas is now being conducted as an interscholastic activity. Again, this has been an outgrowth of instruction received in the regular physical education program with skills improved and advanced through intramural competition. Some schools conducting successful interscholastic programs are located in the Columbia Public Schools System, Columbia, South Carolina; the Dade County Public Schools System, Lindsey Hopkins Building, 1410 Northeast Second Avenue, Miami, Florida 33132; and the Cleveland Public Schools System, 1380 East 6th Street, Cleveland, Ohio 44114.

Chapter 13 Glossary of Bowling Terms

ABC: The American Bowling Congress, an organization of male bowlers; the controlling, regulatory body of U.S. bowling.

Alley: The sixty feet of pine and maple on which the ball is rolled. (Known as "lane" in today's bowling parlance.)

Anchor man: The last man in a team's lineup.

Angling: The method of shooting diagonally across the lane; practiced in spare bowling.

Approach: Maple runway behind the foul line of the lane where the bowler executes his approach.

Average: Figure reached by dividing total sum of game scores by the number of games bowled in one session or season.

Babysplit: The 2-7 or 3-10 split.

Backup Ball: A reverse hook; a ball that for a right handed bowler curves from left to right on the lane.

Ball Return: Unit that retrieves the ball from the pit and allows it to roll to the bowler on the approach.

Box: In scoring, a single frame.

BPAA: The Bowling Proprietors' Association of America. National trade association of bowling center owners.

Brooklyn: A hit to the left of the headpin; in some sections called a Jersey hit.

Bucket: The 2-4-5-8 or 3-5-6-9 spare shots.

Channel: Modern term for the gutter.

Cherry: To miss the pin to the rear of a double pin setup. For example, missing the 3 when shooting for the 1-3.

Clean Game: Complete game with no open frames.

Count: The number of pins knocked down and to be added to the spare occurring in the previous frame.

Curve Ball: A ball that traces a rainbow-type track on the lane; a ball that begins its hooking action very quickly after it is laid on the lane.

Cushion: Barrier to the rear of the pit that absorbs pin and ball hits.

Deadwood: Pins knocked down on pin deck after first ball of frame.

Double: Two consecutive strikes.

Double Balling: Rolling a second ball before the first has been returned.

Double Pinochle: The 4-6-7-10 setup.

Double Wood: Two standing pins, one directly in back of the other; the 2-8; the 3-9.

Dove Tail: Lane splice where maple meets pine.

Dropping the Ball: Dropping the ball on the delivery instead of laying it smoothly on the lane. (Also called dumping.)

Dutch 200: A 200 game accomplished by alternating a strike-spare or a spare-strike for all ten frames plus the extra ball in the tenth frame.

Error: A miss.

Foul: The act of going beyond the foul line as the ball is delivered.

Foul Line: The one-half inch black plastic strip that separates the approach from the lane.

Frame: One-tenth part of a game; one of ten score boxes in which the running score of the game is registered.

Full Hit: In the case of a strike shot, used to describe a ball that hits squarely on the headpin. Used to describe any ball that hits the target squarely or dead center.

Goal Posts: The 7-10 split. (Also called bed or fence posts.)

Gutter: An outdated term for the channel or deep groove on either side of the bowling lanes used to entrap errant balls.

Gutter Ball: Misfired ball that rolls off the lane. (Also called a channel ball.)

Handicap: Adjustment in score totals between individuals or teams to equalize competition.

Headpin: The 1 pin.

High Hit: A strike ball that comes into the pins on the headpin side of the 1-3 pocket.

Hook: For a right-handed bowler, a ball that breaks from the right to the left during the last several feet of its approach to the pins.

House Ball: A ball provided by the bowling center for customer use.

Kegler: A synonym for bowler.

Kickback: Sideboards of pit.

Kickback Plates: Protective coverings for kickbacks.

Kingpin: The 5 pin.

Lane: Sixty-foot maple-pine surface on which the ball is rolled; also called alley.

Lane Rotation: Contesting teams successively alternate two lanes every frame until each bowler has bowled five turns on each lane and the game is completed.

League: An organized group of teams bowling on a regular, formal basis under a specific code of rules and regulations.

Leave: The pins left standing in a frame after the first ball has been rolled.

Light Hit: Strike ball that fails to come up into the 1-3 pocket; any ball that hits to the right of its target. (Also called thin hit.)

Lofting: Throwing the ball out on the lane some point beyond the foul line.

Mark: A strike or a spare.

Miss: An error; sometimes called a blow.

Mixer: A good working ball that produces lots of lively action among the pins.

NBC: The National Bowling Council; bowling industry promotion and service organization.

Nose Hit: A direct center hit on the headpin.

Open Frame: A frame without a strike or spare.

PBA: Professional Bowlers Association; organization of play-for-pay bowlers.

Perfect Strike: A ball that hits the pins squarely in the pocket—between the 1 and 3 pins—to topple over all the pins.

Pinspotter: Automatic machine that sorts, sets, and resets the pins for the bowler. (Also called pinsetter.)

Pit: Box-like area to the extreme end of the lane into which the pins are struck.

Pitch: The angle at which the thumb and finger holes of a ball are drilled out.

Pocket: The area between the 1 and 3 pins; the strike zone. The 1-2 area for left-handed bowlers.

Railroad: A split.

Rake: See Sweep.

Rental Shoes: Bowling shoes provided by the bowling center for customer loan.

Return: See Ball Return.

Running Lane: A lane on which the ball hooks quite readily.

Scratch: Use of actual scores and averages in individual or team competition; nonhandicap bowling.

Sleeper: A hidden or obscure pin; for example, the 9 pin in the 3-9 setup.

Span: On the contour of the ball, the distance between thumb and the finger holes.

Spare: Achieved by knocking down all ten pins in one frame with two rolls of the ball.

Splice: Area on the lane where pine and maple boards are joined.

Split: Two or more pins left standing with a pin down immediately between or ahead of them (providing the #1 pin is down also).

Spot: A targeting guide on the lane used to aid the bowler in directing his ball; also, term used to designate the handicap given another bowler.

Strike: Achieved by knocking down all the pins with the first roll of the ball in a frame.

Strike out: Scoring three consecutive strikes in the tenth frame.

Sweep: The metal mechanism that cleans the pin deck after each delivery of the ball.

Sweeper: A wide-breaking hook or curve that seems to "sweep" all the pins into the pit; a strike.

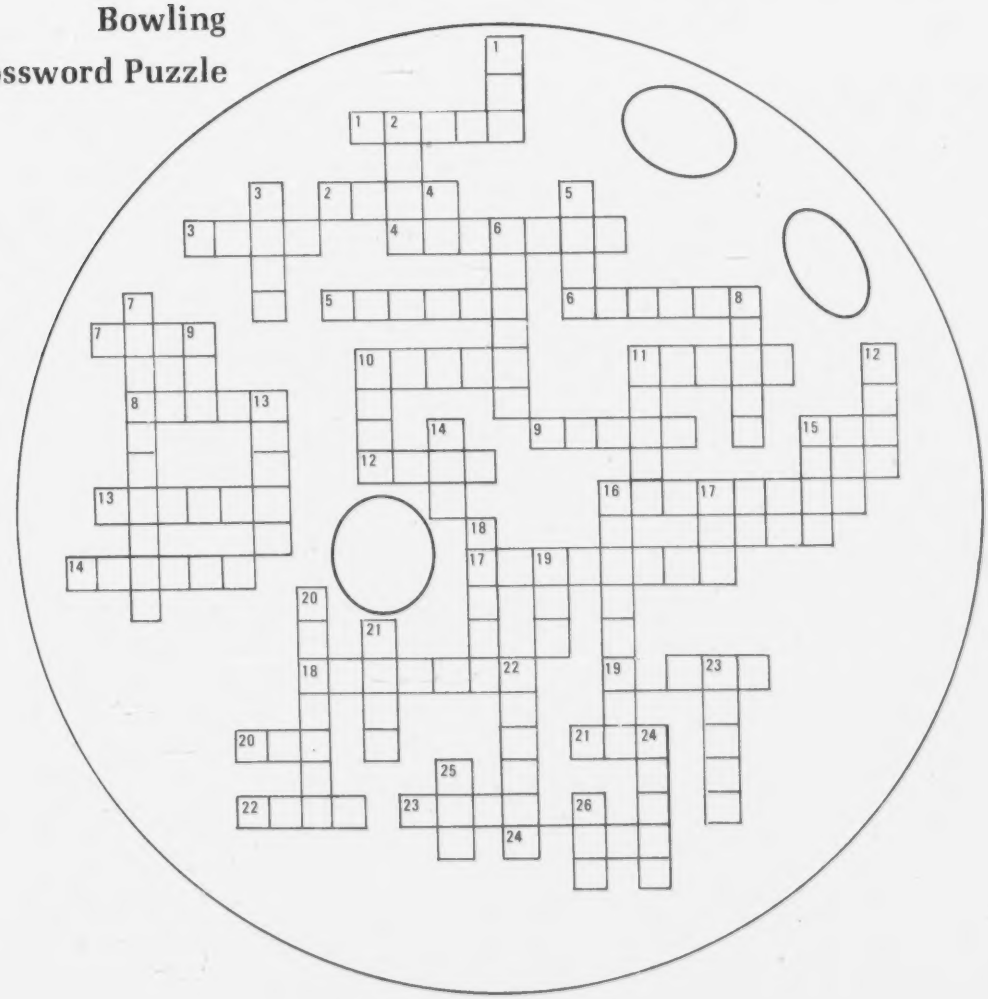
Tap: An apparently perfect strike hit that leaves one pin standing; either the 7, 8, or the 10.

Thin Hit: See Light Hit.

Turkey: Scoring three strikes in succession.

WIBC: Woman's International Bowling Congress; organization of women bowlers in the United States.
Washout: The 1-2-10 or the 1-2-4-10 spares.
Woolworth: The 5-10 split.
Working Ball: Ball that moves with good rolling action; see Mixer.

Bowling Crossword Puzzle



Grid for Crossword Puzzle

ACROSS

1. Located in front of #6 pin
2. A target guide on the lane
3. Distance between the thumb and finger holes
4. The five pin
5. Strike zone
6. All pins knocked down with first ball
7. A strike or spare
8. A reward received
9. Two or more pins standing with one missing between them
10. A section of scoring sheet
11. All pins knocked down with two balls
12. Area between foul line and bowling pins
13. Organized group of regular bowlers
14. Three strikes in succession
15. Doing something enjoyable
16. Swing made with the arm
17. Relation of left foot and right arm when you release the ball
18. Sole of left shoe
19. Level which ball is held to start delivery
20. Piece of equipment
21. Place of instruction for bowling
22. A frame without a strike or spare
23. King pin
24. Arrows on lane;_____finders

DOWN

1. Height you reach on the follow through
2. Ball that breaks to left
3. A piece of equipment
4. The seventh tone of a music scale
5. Error
6. Channel on side of lane
7. Description of proper grip (two words)
8. Miss
9. A boy's name
10. Line which separates approach from lane
11. Motion made with opposite foot on fourth step
12. One pin missing from a full set
13. An article of dress used in bowling
14. Number of head pin
15. Number of players composing a team
16. Motion made with the ball on the first step
17. A female deer
18. How thumb is supposed to fit in ball
19. Professional organization for bowlers (abbr.)
20. Purpose of left hand on steps three and four
21. 9-10 split
22. Sole of right shoe
23. Pin located on extreme left side of lane
24. A means of payment
25. Pin located on diagonal line between three and ten pins
26. Number of the pushaway step

Answers for Crossword Puzzle

ACROSS		DOWN	
1.	Three	1.	Eye
2.	Spot	2.	Hook
3.	Span	3.	Ball
4.	Kingpin	4.	Ti
5.	Pocket	5.	Miss
6.	Strike	6.	Gutter
7.	Mark	7.	Rabbit Ears
8.	Bonus	8.	Error
9.	Split	9.	Ken
10.	Frame	10.	Foul
11.	Spare	11.	Slide
12.	Lane	12.	Nine
13.	League	13.	Shoes
14.	Turkey	14.	One
15.	Fun	15.	Four
16.	Pendulum	16.	Pushaway
17.	Opposite	17.	Doe
18.	Leather	18.	Loose
19.	Waist	19.	PBA
20.	Pin	20.	Balance
21.	Gym	21.	Baby
22.	Open	22.	Rubber
23.	Five	23.	Seven
24.	Range	24.	Money
		25.	Six
		26.	One

Chapter 14
Useful references

Books

AAHPER - DGWS. *Bowling-Fencing-Golf Guide*, latest ed.—published biannually), 1201 - 16th Street. N.W., Washington, D.C. 20036.

AAHPER. *How We Do It Game Book* (3rd ed.). 1964.

AAHPER. *Physical Education for High School Students*, 1970.

American Bowling Congress. *The Guide to Teaching Bowling*. Milwaukee, Wisconsin. 1960. (ABC National Headquarters: 1572 E. Capitol Dr., Milwaukee, Wisconsin 53211)

American Bowling Congress. *Pin Pointers*. Milwaukee, Wisconsin. 1964.

American Machine and Foundry. *Guide to Natural Bowling*, Prep. Kalman, Victor. New York: Perma Books, 1959.

Archibald, John J. *Bowling for Boys and Girls*. Chicago, Ill: Follett Publishing Company, 1963.

Bellisimo, Lou. *The Bowler's Manual* (2nd ed.). Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1969.

Casady, Donald and Marie Liba. *Beginning Bowling* (rev. ed.). Belmont, Calif.: Wadsworth Publishing Co., 1968.

Fazio, Buzz. *Bowling to Win*. New York: Grosset and Dunlap, 1964.

Fraley, O. *Complete Handbook of Bowling*. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1958.

Kidwell, Kathro, and Smith, Paul, Jr. *Bowling Analyzed*. Dubuque, Iowa: Wm. C. Brown Co., Pub., 1960.

McMahon, Junie and Goodman, Murray. *Modern Bowling Techniques*. New York: Ronald Press, 1958.

Nagy, Steve, and others. *The Complete Guide to Better Bowling*. New York: Random House, 1956.

Weber, Dick. *Champions' Guide to Bowling*. Fleet Publishing Corp., 1964.

Films

"How to Improve your Bowling," slide films and teaching manual produced by the Athletic Institute, 805 Merchandise Mart, Chicago, Ill., and the Billiard and Bowling Institute of America.

"The Wonderful World of Bowling," film section, Miller Brewing Co., 4000 West State Street, Milwaukee, Wisconsin.

Viewgraph Transparencies 49-50, Bowling Corporation.

Free Materials

"Better Bowling and How It's Done," any Ebonite Ball dealer.

"How to Have the Most Bowling Fun," National Bowling Council, 3925 West 103rd Street, Chicago, Illinois.

"How to Keep Score," various bowling manufacturers, generally available at most sporting goods stores.

"More Pins, More Fun," Brunswick Corp., 623 South Wabash Avenue, Chicago, Illinois.

Appendix A
A Brief History of Bowling

Accurate information concerning the early history of the ancient game of bowling or "bowls" is difficult to obtain. Some believed that the men and boys of the Stone Age may have originated a form of bowling in which large pebbles and rocks were rolled at a row of flat-based, pointed stones or cones. Implements for playing a game with marked similarities to the modern game of tenpins were discovered in the grave of an Egyptian child who was buried around 5200 B.C. Thus, bowling is reputed to be more than 7,000 years old.

The ancient Polynesians (inhabitants of the South Sea Islands) participated in a game of bowling, called Ula Moika, in which small elliptical balls and small round, flat stone disks were used. Sixty feet was established as the distance from which the bowlers bowled at the stones—the identical specification used in tenpin bowling today.

Some bowling authorities place the origin of bowling in Europe in what is today Northern Italy. The Helvetii, who lived in the Alpine regions during Caesar's time (50 B.C.), were said to have played a game similar to the present-day Italian bowling game of boccie.

Much of the early development of bowling at *pins* did not originate as a sport, but rather as a religious ceremony. The ancient chronicles of Paderborn reveal that the first pin bowling was done as early as the third century, A.D. in the cloisters of cathedrals. The parishioner was given a ball by a parish canon who directed him to roll it at his pin, which represented the "Heide," meaning heathen, and which was placed in the far end of the cloister. A hit indicated that the thrower was leading a clean and pure life and was capable of slaying the heathen. A miss indicated that a more faithful attendance at services would help his aim.

Into the Middle Ages and later, bowling was very popular in Germany. At all the village dances, at baptisms and country celebrations, bowling held an

important role. The wealthy burghers had bowling lanes on their estates and in their courtyards. Most of the ancient palaces contained a bowling lane where the lord of the palace could entertain his friends.

At a much later time, Martin Luther, an enthusiastic bowler, experimented and found that nine pins made an ideal bowling game. This number of pins was finally accepted as the standard number of pins in Germany. When played indoors, the ball was rolled at the pins; when played outdoors, if the surface was rough, a player was permitted to choose between rolling and throwing at the pins.

Different types of bowling games were introduced from time to time in various sections of Europe. The ninepins game became the favorite pastime in Holland. Skittles was introduced into England near the beginning of the 14th Century, where it became quite popular. It was also practiced on the Continent of Europe in early times, although it was not confined to ninepins as in England. Curling, which is an adaptation of the ancient game of bowls, was introduced into Scotland by the Flemish immigrants in the 16th Century. Often called "bowling on ice," this game gained popularity in those countries that had severe winters.

While all of the above games played a role in the development of the modern game of bowling, the ancient game of ninepins appears to have played the most dominant role.

The sport of bowling, like most other sports, has borne its share of legislative oppression. King Edward II (1366) became concerned that the practice of archery, an extremely important military skill, would suffer because of the time spent playing the game of bowls. This concern prompted parliament to pass legislation forbidding the playing of bowls.
Sir Francis Drake (1540-96 A.D.), the famous English admiral who circumnavigated the globe, was an ardent bowling disciple. He helped to make immemorable the sport of bowling by refusing to stop a match game in which he was engaged, even though the supposedly invincible Spanish Armada was approaching in attack formation. Drake insisted that the

match should be played out, saying that there was plenty of time both to win the game and to beat the Spaniards. After the game he took the principal part in destroying the great Spanish Armada.

The early Dutch settlers of Manhattan Island (1626) brought the game of bowling with them. In 1732 the vacant space of ground immediately in front of the Battery Fort, now lower Broadway in New York City, was, for the rental price of one "pepper corn," leased and enclosed for a bowling green. This area still bears the name "Bowling Green."

In British North America, bowls first saw the light in Nova Scotia. In 1734 an enclosure was reserved as a green for the officers of the garrison of Annapolis (Port Royal), while the Duke of Kent had a green laid down in his grounds at Prince's Lodge, Bedford, Halifax.

Even though the sport of bowling was forbidden by the Puritans, some of them were unable to resist temptation. One confessed to the following in 1658. "This game of bowles has bewitched me, I fear. For I played it today and for funds. Yes, I was fortunate, for the bet was £10. Woe unto me! My fellow Puritans will be shocked if they hear of this, but the more reason for my confession. I like the game, my own ability to win, and the fine folks I met on the greens."

By 1820, the game of ninepins had become the generally accepted bowling game. By this time, gamblers were beginning to control ninepins bowling. Most of the matches were rigged; many people were swindled, a practice that proved to be the game's undoing. So openly and brazenly had this bad feature become in Connecticut, Massachusetts, and New York that the game was classified as gambling. In 1841, the Connecticut State Legislature passed an act prohibiting ninepin bowling.

The person or persons who first experimented, probably between 1820 and 1830, with the tenpin bowling arrangement are unknown. Since the state laws that were passed two decades later specifically prohibited ninepins only, the tenth pin circumvented the law, thus causing tenpins bowling to be rapidly accepted. This apparently met with the approval of the state legislators who permitted the tenpin game to

grow and become well established. However, the rampant gambling of the sport was not permitted to continue. One of the major changes in bowling that resulted from the addition of a tenth pin was to change the diamond formation of the ninepins to the present triangular formation of the ten pins.

Those who devised the game of tenpins brought into being a game which is now played by an estimated 40 million men and women, not only in the United States and Canada, but in foreign countries as well. The American Bowling Congress rules, regulations, and specifications for tenpins have been almost universally adopted in these countries.

END